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Report On

Emergency Beacons Testing of the
Standard Communications
MT403G EPIRB

COMMERCIAL-IN-CONFIDENCE

Document 75901666 Report 03 Issue 1

March 2008



Product Service

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COMMERCIAL-IN-CONFIDENCE

REPORT ON

Emergency Beacons Testing of the
Standard Communications
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PREPARED FOR

Standard Communications Pty Ltd
6 Frank Street
Gladesville
NSW
Australia

PREPARED BY

A handwritten signature in black ink, appearing to read 'M. P. Hardy', written over a horizontal line.

M P Hardy
Test Engineer

APPROVED BY

A handwritten signature in black ink, appearing to read 'M. Jenkins', written over a horizontal line.

M Jenkins
Authorised Signatory

DATED

07 March 2008



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SECTION 1

REPORT SUMMARY

Emergency Beacons Testing of the
Standard Communications
MT403G EPIRB



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Emergency Beacons Testing of the Standard Communications MT403G EPIRB to the requirements of RTCM Paper 77-2002/SC110-STD.

Objective	To perform Emergency Beacons Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Standard Communications Pty Ltd
Model Number(s)	MT403G EPIRB
Serial Number(s)	75901666_01 MT403G S/N 33790 75901666_28 MT403FG S/N 33700
Number of Samples Tested	Two
Additional Model Variant(s)	MT403FG (Float free unit) MT403 (Non-GPS unit) MT403FF (Non-GPS Float Free unit)
Test Specification/Issue/Date	RTCM Paper 77-2002/SC110-STD
Incoming Release Date	Application Form 09 October 2007
Order Number Date	PO52559 20 June 2007
Start of Test	22 August 2007
Finish of Test	29 February 2008
Name of Engineer(s)	M P Hardy R Hampton R Henley S Mooney C Hedley C Foster A Castle C Bowles



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Related Document(s)	<p>MIL-STD-810D (19 July 1983), method 509.2.</p> <p>COSPAS-SARSAT C/S T.001, Specification for COSPAS-SARSAT 406 MHz Distress Beacons.</p> <p>COSPAS-SARSAT C/S T.007, COSPAS-SARSAT 406 MHz Distress Beacon Type Approval Standard.</p> <p>International Maritime Organization (IMO), Assembly Resolution A.810(19), Performance Standards for Float-Free Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating on 406 MHz.</p> <p>International Maritime Organization (IMO), Assembly Resolution A.662(16), Performance Standards for Float-Free Release and Activation Arrangements for Emergency Radio Equipment.</p> <p>International Maritime Organization (IMO), Assembly Resolution A.689(17), Recommendation on Testing of Life-Saving Appliances.</p> <p>U.S. Government Printing Office, U.S. Code of Federal Regulations, Title 46, Subpart 160.062, Releases. Lifesaving Equipment, Hydraulic and Manual.</p> <p>U.S. Government Printing Office, U.S. Code of Federal Regulations, Title 46, Subpart 164.018, Retroreflective Material for Lifesaving Equipment.</p> <p>Naval Publications and Forms Center (NPFC) MIL-STD-810D, method 509.2, 19 July 1983, Environmental Test Methods and Engineering Guidelines, pp.509.2-5 to 509.2-10.</p> <p>Naval Publications and Forms Center (NPFC) MIL-O-55310B, Military Specification, General Specifications for Crystal Oscillators, page 44, paragraph 4.9.34.2.1, 1 April 1987.</p>
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1.2 APPLICATION FORM

1.2.1 Beacon Manufacturer and Beacon Model

Beacon Manufacturer	Standard Communications Pty Ltd
Beacon Model	MT403G

1.2.2 Beacon Type and Operational Configurations

Beacon Type	Beacon used while:	Tick where appropriate
EPIRB	Floating in water or on deck or in a safety raft	<input checked="" type="checkbox"/>
PLB	On ground and above ground	<input type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
ELT Survival	On ground and above ground	<input type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
ELT Auto Fixed	Fixed ELT with aircraft external antenna	<input type="checkbox"/>
ELT Auto Portable	In aircraft with an external antenna	<input type="checkbox"/>
	On ground, above ground, or in a safety raft with an integrated antenna	<input type="checkbox"/>
ELT Auto Deployable	Deployable ELT with attached antenna	<input type="checkbox"/>
Other (specify)		<input type="checkbox"/>



1.2.3 Beacon Characteristics

Characteristic	Specification
Operating temperature range	Tmin = -20°C Tmax = +55°C
Operating lifetime	48+ hours
Battery chemistry	LiMnO ₂ / Organic Electrolyte
Battery cell size and number of cells	5 batteries @ 2 cells CR2/3AH or CR17345
Battery manufacturer	Varta
Battery pack manufacturer and part number	Standard Communications - 97MT403BAT or VARTA - 08001
Oscillator type (e.g. OCXO, MCXO, TCXO)	MCXO
Oscillator manufacturer	Standard Communications
Oscillator part name and number	na
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes
Antenna type (Integrated or External)	Integrated
Antenna manufacturer	na
Antenna part name and number	na
Navigation device type (Internal, External or None)	Internal
Features in beacon that prevent degradation to 406 MHz signal or beacon lifetime resulting from a failure of navigation device or failure to acquire position data (Yes, No, or N/A)	Yes
Features in beacon that ensures erroneous position data is not encoded into the beacon message (Yes, No or N/A)	Yes
Navigation device capable of supporting global coverage (Yes, No or N/A)	Yes



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Characteristic	Specification
For Internal Navigation Devices	
- Geodetic reference system (WGS 84 or GTRF)	WGS 84
- GNSS receiver cold start forced at every beacon activation (Yes or No)	Yes
- Navigation device manufacturer	ublox
- Navigation device model name and part Number	TIM-4A, LEA-4A
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	GPS
For External Navigation Devices	
- Data protocol for GNSS receiver to beacon interface	na
- Physical interface for beacon to navigation device	na
- Electrical interface for beacon to navigation device	na
- Navigation device model and manufacturer (if beacon designed to use specific devices)	na



Characteristic	Specification
Self-Test Mode Characteristics	
- Self-test has separate switch position (Yes or No)	Yes
- Self-test switch automatically returns to normal position when released (Yes or No)	Yes
- Self-test activation can cause an operational mode transmission (Yes or No)	No
- Self-test causes a single beacon self-test message burst only regardless of how long the self-test activation mechanism applied (Yes or No)	No
- Results of self-test indicated by (e.g. Pass / Fail Indicator Light, Strobe Light, etc.)	Visual & Audible indication
- Self-test can be activated from beacon remote activation points (Yes or No)	No
- Self-test performs an internal check and indicates that RF power emitted at 406 MHz and 121.5 MHz if beacon includes a 121.5 MHz homer (Yes or No)	Yes
- Self-test transmits a signal(s) other than at 406 MHz (Yes & details or No)	Yes, unmodulated 121.5MHz carrier
- Self-test can be activated directly at beacon (Yes or No)	Yes
- List of Items checked by self-test	battery voltage, RF output, PLL lock, firmware checksum, 406 message checksum, GPS alive
- Self-test transmission burst duration (440 or 520 ms)	520 ms
- Self-test format bit ("0" or "1")	1



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Characteristic	Specification
Beacon includes a homer transmitter (if yes identify frequency of transmission)	121.5MHz
-Homer Transmit Power	17dBm
-Homer Duty Cycle	>96%
-Duty Cycle of Homer Swept Tone	37%
Beacon includes a strobe light (Yes or No)	Yes
- Strobe light intensity	>0.75cd
- Strobe light flash rate	20~21/min
Beacon transmission repetition period satisfies C/S T.001 requirement that two beacon's repetition periods are not synchronised closer than a few seconds over 5 minute period, and the time intervals between transmissions are randomly distributed on the interval 47.5 to 52.5 seconds (Yes or No)	Yes
Other ancillary devices (e.g. voice transceiver). List details on a separate sheet if insufficient space to describe.	No
Beacon includes automatic activation mechanism (Yes or No)	Yes

1.2.3 Information Provided by the Cospas-Sarsat Accepted Test Facility


Name and Location of Beacon Test Facility: TUV Product Service Ltd, United Kingdom

Date of Submission for Testing: August 2007

Applicable C/S Standards:

Document	Issue	Revision	Date
C/S T.001	3	7	Nov-05
C/S T.007	4	1	Oct-06

I hereby confirm that the 406 MHz beacon described above has been successfully tested in accordance with the Cospas-Sarsat Type Approval Standard (C/S T.007) and complies with the Specification for Cospas-Sarsat 406 MHz Distress Beacons (C/S T.001) as demonstrated in the attached report.

Signed: 
 Name: M Jenklins
 Position Held: Authorised Signatory
 Date: 07 March 2008



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1.2 APPLICATION FORM**1.2.4 Applicant Details**

Company Name	Standard Communications Pty Ltd		
Address	6 Frank Street Gladesville NSW Australia		
Category of Applicant	<input checked="" type="checkbox"/> Manufacturer	<input type="checkbox"/> Importer	
	<input type="checkbox"/> Distributor	<input type="checkbox"/> Agent	
Contact Name	Craig DUNCAN	Telephone	+ 61 (0)2 9844 6666
Email	cduncan@gme.net.au	Facsimile	+61 (0)2 9844 6600

1.2.5 Manufacturer Details

Company Name	Same as above		
Address			
Contact Name		Telephone	
Email		Facsimile	

1.2.6 Declaration of Build Status

Hardware Version	1
- PCB Revision	
- Battery Model	97MT403BAT (Varta)
Software Version	na
Firmware Version	OS0012.1.03
Other (Specify)	na

1.2.7 Applicant's Declaration

I hereby declare that I am entitled to sign on the behalf of the applicant and that the information supplied is correct and complete

Signed: Supplied via e-mail

Name: Craig Duncan

Position Held: Project Engineering Manager

Date: 06/03/2008



1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a Standard Communications MT403G EPIRB as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test, Sample Serial Number 33790



1.3.2 Test Configuration

All tests were performed on the same sample (with the exception of solar radiation and the automatic release tests). Tests requiring a conducted link to the EUT's transmitter were performed with the test sample modified, by the manufacturer, to provide a 50Ω output port for 406 MHz measurements via a matching network. This matching network caused some loss in power, where this affects the test details can be found at the relevant section.

1.3.3 Modes of Operation

Modes of operation of the EUT during testing were as follows:

Test Mode 1: Idle; Beacon in quiescent state (main switch set to 'READY').

Test Mode 2: Operating; Beacon activated (main switch set to 'ON'). 406 MHz and 121MHz Transmitters active, EUT programmed with test mode as per Cospas-Sarsat T.007. Note: this is sometimes referred to as "Normal" mode due to the normal frame sync.

Test Mode 3: Self-test mode; Beacon activated by depressing the 'TEST' switch. Pre-programmed self-test mode runs and beacon subsequently returns to idle mode.

Specific test modes used are detailed in the test procedure for each individual test.

The EUT was powered by its internal battery.

1.3.4 Monitoring of Performance

Aliveness Test comprises successful self-test of beacon into a beacon tester and confirmation strobe flash.

1.3.5 Performance Criterion

EUT must successfully complete the aliveness test.

1.3.6 Additional Variants

Variants of the MT403G EPIRB include the MT403FG (Float Free GPS unit), MT403 (Non-GPS unit) and the MT403FF (Non-GPS Float Free unit).

The four models are described as:

- MT403 is manual and water activated base model.
- MT403G is configured by internally fitting applique module comprising GPS macro-module and passive quadrifilar helix antenna. The EPIRB cap is replaced with an alternate one that has an added feature to correctly locate and retain the helix antenna. No other changes.
- MT403FF is configured by swapping the manual release bracket for the auto-release housing. Further the small plastic adapter is added to make the base MT403 compatible with the retention points within the auto-release housing and locate the EPIRB correctly. The addition of the adapter is the only physical change to the actual MT403 base model
- MT403FG is created by applying both 2) and 3) above.



1.4 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.5 MODIFICATION RECORD

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	N/A	N/A
1	Like for like replacement of the following components following a non test related incident: Annunciator Antenna Screen	Standard Communications PTY LTD	As supplied 01 October 2007
2	Part of the modification to add the 50 ohm interface was showing signs of water ingress (around the Nylon Bolt). As a precaution, joints on the 50 ohm matching circuit were re-soldered. Performance against the RTCM spurious emissions mask was evaluated and the modulation frequency variables used by the firmware were subsequently modified. The Frequency Down sweep Profile and start frequency were altered to ensure that less time is spent at the higher frequencies which in turn results in less energy being produced at high modulation harmonics. These parameters are all still within the 121.5MHz modulation specification requirements but shape the spectrum to ensure compliance (with margin) against the emission mask.	Standard Communications PTY LTD	As supplied 02 January 2008



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1.6 ALTERNATIVE TEST SITE

Under our group UKAS Accreditation, TÜV Product Service Ltd conducted the following tests at Bearley, Stratford-upon-Avon Test Laboratory:

2.24 Peak Equivalent Radiated Power

Under our group UKAS Accreditation, TÜV Product Service Ltd conducted the following tests at Hornet Sailing Club, Gosport:

2.8 Drop Test in Water

The following test was sub-contracted:

A14.0 Float Free Activation Test; carried out at the QinetiQ EMES Facility, Farnborough



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SECTION 2

TEST DETAILS

Emergency Beacons Testing of the
Standard Communications
MT403G EPIRB



TEST RESULTS TABLE

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T _{min} (-20°C)	T _{amb}	T _{max} (+55°C)	
1. Initial Aliveness Test (A1.0)						Section 2.1 Result: Pass
<ul style="list-style-type: none"> • Aliveness Test: <ul style="list-style-type: none"> - Carrier Frequency - Power Output 	406.028±0.001 35 - 39	MHz dBm		406.0369867 35.37		Note: Carrier Frequency is in accordance with new Cospas Sarsat guidelines.
2. Dry Heat Cycle (A3.0)						Section 2.2 Result: Pass
<ul style="list-style-type: none"> • Aliveness Test (during 2 hour period) • Aliveness Test (at end of 2 hour period) 	Successful self-test Successful self-test	✓ ✓			✓ ✓	
3. Damp Heat Cycle (A4.0)						Section 2.3 Result: Pass
<ul style="list-style-type: none"> • Aliveness Test (during 2 hour period) • Aliveness Test (at end of 2 hour period) 	Successful self-test Successful self-test	✓ ✓			✓ ✓	
4. Vibration Test (A5.0)						Section 2.4 Result: Pass
<ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test • Activation 	No damage Successful self-test No activation during test	✓ ✓ ✓		✓ ✓ ✓		
5. Bump Test (A6.0)						Section 2.5 Result: Pass
<ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test • Activation 	No damage Successful self-test No activation during test	✓ ✓ ✓		✓ ✓ ✓		
6. Salt Fog Test (A7.0)						Section 2.6 Result: Pass
<ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test 	No damage Successful self-test	✓ ✓		✓ ✓		



Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments	
			T _{min} (-20°C)	T _{amb}	T _{max} (+55°C)		
7-A. Drop Test (A8.1) On Hard Surface						Section 2.7 Result: Pass	
<ul style="list-style-type: none"> Exterior Mechanical Inspection Aliveness Test Activation 	No damage Successful self-test No activation during test	✓ ✓ ✓	✓ ✓ ✓			The EUT was soaked at the minimum stowage temperature (-30°C) prior to the drop.	
7-B. Drop Test (A8.2) In Water							Section 2.8 Result: Pass
<ul style="list-style-type: none"> Exterior Mechanical Inspection Aliveness Test 	No damage Successful self-test	✓ ✓		✓ ✓			
8. Leakage And Immersion Test (A9.0)						Section 2.9 Result: Pass	
Leakage & Immersion <ul style="list-style-type: none"> Aliveness Test Interior Inspection 	Successful self-test No water	✓ ✓		✓ ✓			
9. Spurious Emissions Test (A10.0)						Section 2.10 Result: Pass	
<ul style="list-style-type: none"> 406 MHz 121.5 MHz 	Figure 2-1 Figure 2-6	✓ ✓	✓ ✓	✓ ✓	✓ ✓		



Parameter To Be Measured	Range Of Specification	Units	Test Results		Comments
			High-Temperature		Low-Temperature
10. Thermal Shock (A11.0)					Sections 2.12 & 2.11 respectively Result: Pass
<ul style="list-style-type: none"> • Self-activation in fresh water • Self-activation in salt water (5% NaCl*) • Aliveness Test: <ul style="list-style-type: none"> – Carrier Frequency • Frequency Stability: <ul style="list-style-type: none"> – short term stability – medium term stability: <ul style="list-style-type: none"> – mean slope – residual frequency variation 	5 5 406.028±0.001 0.002 0.001 0.003	minutes minutes MHz parts/ million in 100ms parts/ million/ minute parts/ million	1 1 406.0369672 406.0369689 1.80x10 ⁻¹⁰ 2.10x10 ⁻¹⁰ -1.42x10 ⁻¹⁰ -1.71x10 ⁻¹⁰ 6.62x10 ⁻¹⁰ 6.94x10 ⁻¹⁰	1 1 406.0369965 406.0369992 1.82x10 ⁻¹⁰ 2.14x10 ⁻¹⁰ -3.58x10 ⁻¹⁰ -4.33x10 ⁻¹⁰ 6.00x10 ⁻¹⁰ 7.67x10 ⁻¹⁰	*5% NaCl by mass Where two values are stated these are the minimum and maximum
11. Cospas-Sarsat Type Approval (A12.0)					
Cospas-Sarsat Certificate	Provided (attach test report)	Y/N	Pending Approval		



Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T _{min} (-20°C)	T _{amb}	T _{max} (+55°C)	
12. Operational Life, Strobe Light and Self-tests (A13.0)						Section 2.13 Result: Pass
<ul style="list-style-type: none"> Operational Life Frequency: <ul style="list-style-type: none"> Nominal Carrier Short-term stability Medium-term stability: <ul style="list-style-type: none"> Mean Slope Residual Variation RF output power Auxiliary radio-locating Peak envelope power 	Time to first Failure 406.028±0.001 0.002 0.001 0.003 35 - 39 14 - 20	Hours MHz parts/ million in 100ms parts/ million/ minute parts/ million dBm dBm	49.1 406.0370048 406.0370142 1.261x10 ⁻¹⁰ 4.475x10 ⁻¹⁰ -2.674x10 ⁻¹⁰ 4.194x10 ⁻¹⁰ 3.003x10 ⁻¹⁰ 1.486x10 ⁻⁹ 36.31 36.99 14.714 15.149			Where two values are stated these are the minimum and maximum up to 49.1 hours Path loss through a matching circuit of 1.71 dB has been applied to the result (making the actual power higher) The Insertion loss at 121.4 MHz is 11.78dB. This offset has been added to the levels recorded in the test plots.
13. Strobe Light Test (A13.2)						Section 2.14 Result: Completed
<ul style="list-style-type: none"> Flash Rate Effective intensity Pulse Duration 	20 - 30 0.75 10 ⁻⁶ to 10 ⁻²	/min Cd s	20 2.00* 9.77x10 ⁻³	20 2.01* 9.75x10 ⁻³	20 1.96* 9.73x10 ⁻³	* As per customer supplied information – refer to Annex A
14. Self-test (A13.3)						Section 2.15 Result: Pass
<ul style="list-style-type: none"> RF pulse duration Frame synchronisation pattern Number of RF bursts 	<444 or <525* 0 1101 0000 1-burst	ms ✓ ✓	520.7013 ✓ ✓	520.5828 ✓ ✓	520.0304 ✓ ✓	* Range Of Specification dependant on message length. EUT coded with long message, hence limit is <525ms



Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T _{min} (-20°C)	T _{amb}	T _{max} (+55°C)	
15. Automatic Release Mechanism Test						Section 2.16 Result: Pass
<ul style="list-style-type: none"> Normal mounted orientation Rolling 90° starboard Rolling 90° port Rolling 90° bow down Rolling 90° stern down Upside down 	Release and float free before 4 meters; automatic activation	✓ ✓ ✓ ✓ ✓ ✓	✓ [shaded]	✓ ✓ ✓ ✓ ✓ ✓	✓ [shaded]	Refer to Annex B – QinetiQ Certificate of Test.
16. Stability and Buoyancy Test (A15.0)						Section 2.17 Result: Pass
<ul style="list-style-type: none"> Time to upright Reserve buoyancy Float upright; Antenna base 	< 2 > 5 > 4	seconds % cm	[shaded]	1.56 53.2 6	[shaded]	
17. Inadvertent Activation Test (A16.0)						Section 2.18 Result: Completed
<ul style="list-style-type: none"> Activation/Release 	EUT should not release from bracket or automatically activate	✓	[shaded]	✓*	[shaded]	*As per Customer supplied information and waiver request – refer to Annex A



Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T _{min} (-20°C)	T _{amb}	T _{max} (+55°C)	
18. Auxiliary Radio-Locating Device Transmitter Test (A17.0)						Result: Pass
• Carrier frequency	121.5 ± 0.006	MHz	121.4004923		121.4024529	Carrier offset to 121.4MHz. Section 2.19
• Duty cycle	100	%	96.10		96.35	Section 2.20
• Modulation:						
– Frequency	700 Hz within the range of 300 - 1600 Hz	✓	✓		✓	Section 2.21
– Range	> 700	Hz	723.04		710.93	
– Minimum	> 300	Hz	439.12		437.79	
– Maximum	< 1600	Hz	1162.16		1148.71	
– Direction	Upward	Upward / Downward	Downward		Downward	
– Duty cycle	33 - 55	%	46.51		46.98	
– Sweep repetition rate	2 - 4	Hz	2.86		2.83	
– Factor	0.85 - 1.0	#	0.93		0.95	Section 2.22
– Frequency Coherence	30% Power < ±30 Hz	✓	✓		✓	Section 2.23
– Frequency shift after 406 MHz burst	Shift < ±30 Hz	✓	✓		✓	
• PERP	14 - 20	dBm				Section 2.24
• Antenna:						
– Pattern	Omnidirectional	✓				
– Polarisation	Vertical	✓				
– VSWR	< 1.5:1	✓				Section 2.25



Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T _{min} (-20°C)	T _{amb}	T _{max} (+55°C)	
19. Humidity Test (A18.0)						Section 2.26 Result: Pass
• Aliveness Test	Successful self-test	✓			✓	
20. Orientation Test (A19.0)						Section 2.27 Result: Pass
Vertical						
• Aliveness Test	Successful self-test	✓			✓	
Upside Down						
• Aliveness Test	Successful self-test	✓			✓	
Horizontal						
• Aliveness Test	Successful self-test	✓			✓	



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2.1 INITIAL ALIVENESS TEST**2.1.1 Specification Reference**

RTCM Paper 77-2002/SC110-STD, Clause A1.0

2.1.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.1.3 Date of Test and Modification State

23 August 2007 - Modification State 0

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Operating Modes

The test was performed with the EUT in the following mode(s): Normal and Self-test

2.1.6 Environmental Conditions

Ambient Temperature 22.5°C
 Relative Humidity 34%
 Atmospheric Pressure 977mbar

2.1.7 Test Results

Parameter	Value	Units
Carrier Frequency	406.0373	MHz
Power Output	Unit configured for radiated testing, power output could not be measured.	dBm



Product Service

Beacon Test Report (Normal Message)

Beacon Test Report

1D1E41FF3F81FE0

Organization:
Tested By:
Date: 23-Aug-07 10:31:25 AM
Tester Model/Serial No./File Name: BT100S/1025/01666_InitAlive-9
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

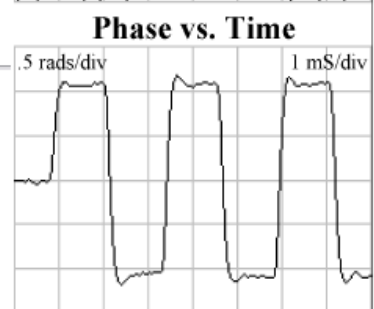
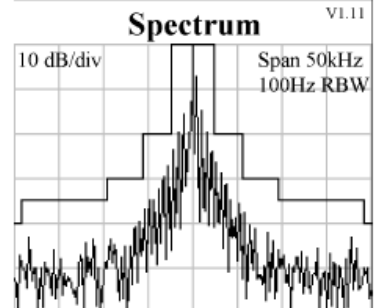
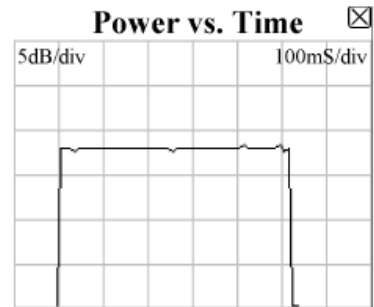
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 65%
Power Rise Time: < 5 ms
Phase Deviation: -1.07 +1.08 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 153 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.5 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Self-test Message)

Beacon Test Report

1D1E41FF3F81FE0

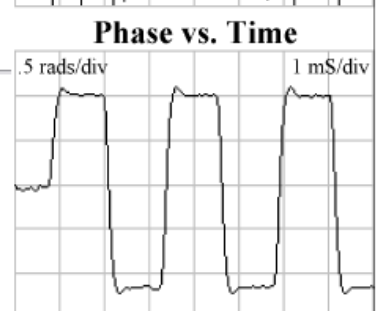
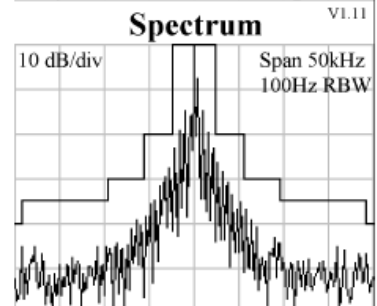
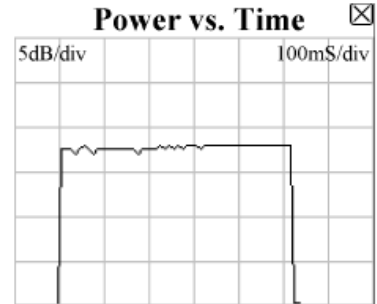
Organization:
Tested By:
Date: 23-Aug-07 10:29:55 AM
Tester Model/Serial No./File Name: BT100S/1025/01666_InitAlive-8
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

PASS
 FAIL
 INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 70%
Power Rise Time: < 5 ms
Phase Deviation: -1.15 +1 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 155.4 ms



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.2 DRY HEAT CYCLE

2.2.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A3.0

2.2.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.2.3 Date of Test and Modification State

26 February 2008 - Modification State 2

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

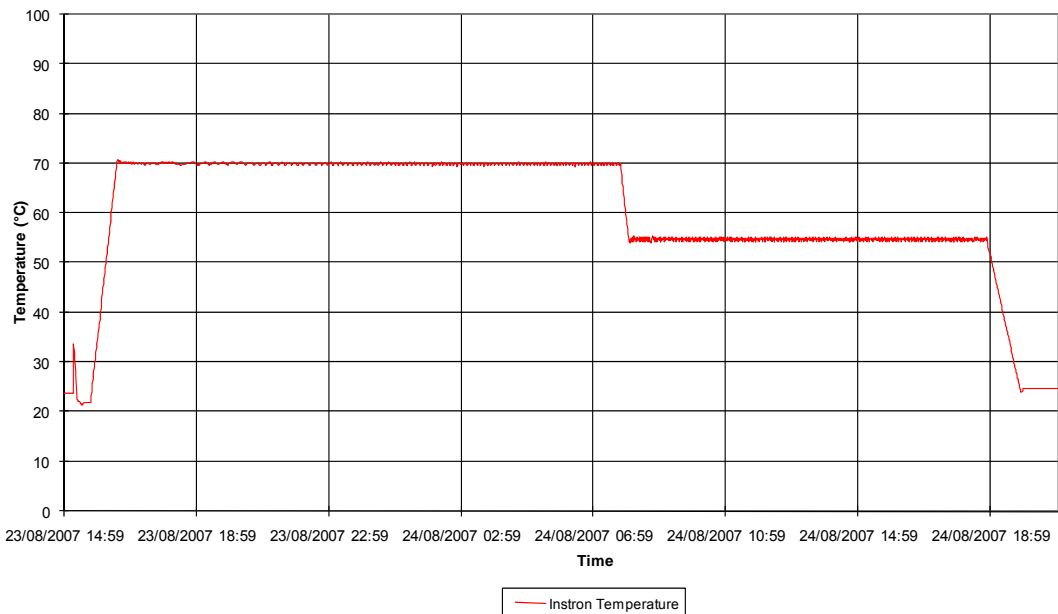
2.2.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle and Operating as per “Specification Reference”, above.

2.2.6 Environmental Conditions

Dry Heat Cycle Temperature Plot

75901666-51000 Standard Communications EPIRB Dry Heat Test





Product Service

2.2.7 Test ResultsSummary of Aliveness test results

Stage	Pass / Fail
During Two Hour Dwell, Message 1	Pass
End Of Two Hour Dwell, Message 1	Pass



Product Service

Beacon Test Report (Aliveness Test, During Two Hour Dwell)

Beacon Test Report
1D1E41FF3F81FE0

Organization: TUV Product Service
Tested By: BT100A S/N: 2383
Date: 8/24/07 8:42:11 PM
Tester Model/Serial No./File Name: BT100S/2383/std com-2
Tester Cal Due Date: Sep 6, 2008
Tester Temperature: 25°C

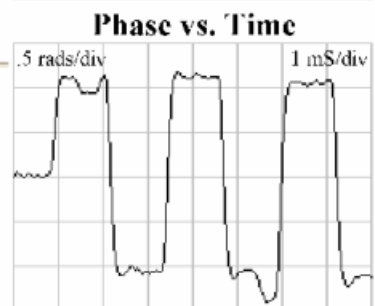
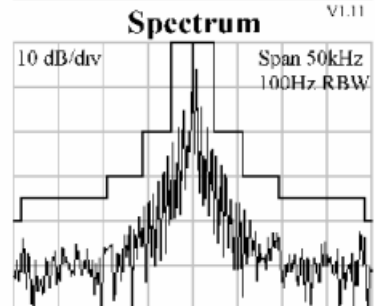
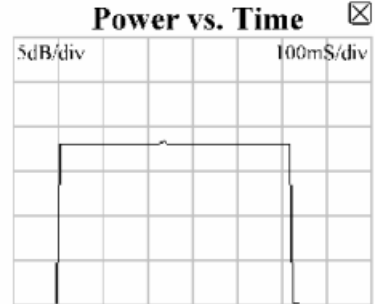
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0371 MHz
406 Power (INT ANT): 88%
Power Rise Time: < 5 ms
Phase Deviation: -1.05 +1.12 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.6%
Modulation Bit Rate: 399.5 bps
CW Preamble: 161.1 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.





Product Service

Beacon Test Report (Aliveness Test, End Of Two Hour Dwell)

Beacon Test Report

1D1E41FF3F81FE0

Organization: TUV Product Service
Tested By: BT100A S/N: 2383
Date: 8/25/07 6:27:39 AM
Tester Model/Serial No./File Name: BT100S/2383/std com-3
Tester Cal Due Date: Sep 6, 2008
Tester Temperature: 27°C

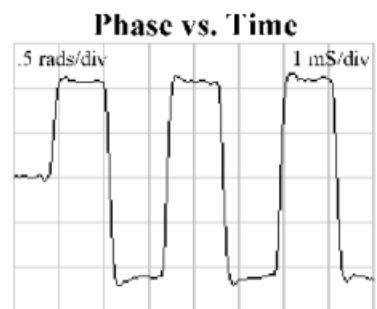
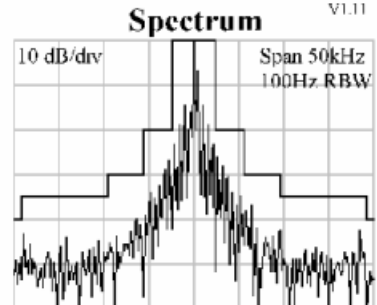
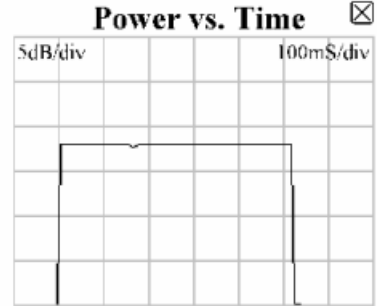
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.037 MHz
406 Power (INT ANT): 86%
Power Rise Time: < 5 ms
Phase Deviation: -1.12 +1.07 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 161.1 ms

121.5 MHz Measurements
121 Frequency (INT REF): 121.5062 MHz
121 Power (INT ANT): 80%
Sweep Direction: Downwards
Audio Frequency: 437 Hz to 1375 Hz
Sweep Range: 938 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 89 %
Duty Cycle: 36 %



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Product Service

2.3 DAMP HEAT CYCLE

2.3.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A4.0

2.3.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.3.3 Date of Test and Modification State

04 September 2007- Modification State 0

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

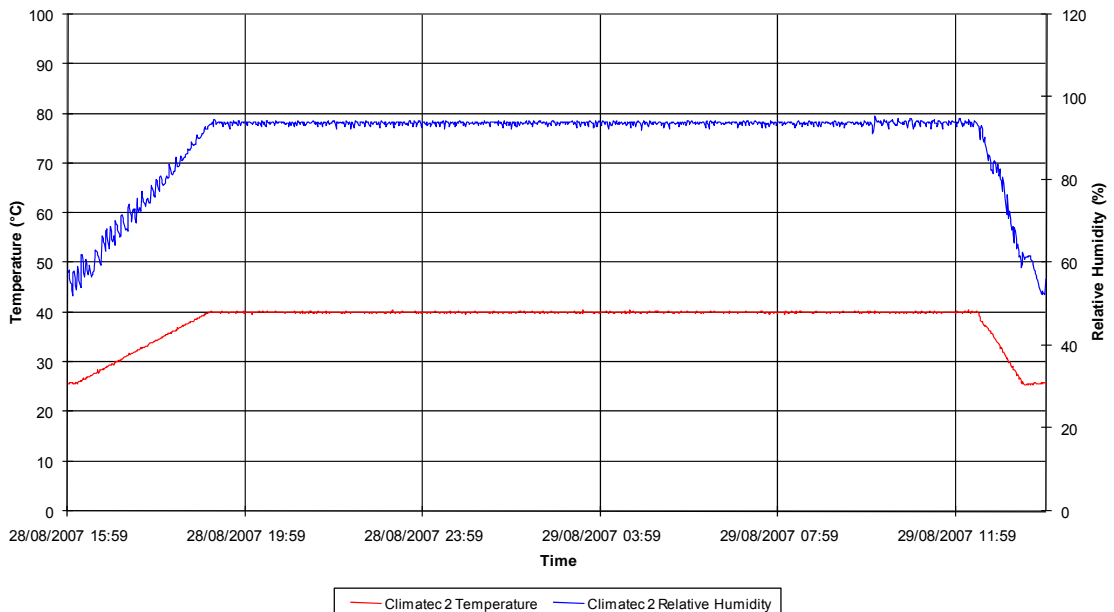
2.3.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle and Operating as per “Specification Reference”, above.

2.3.6 Environmental Conditions

Damp Heat Cycle Temperature Plot

75901666-51000 Standard Communications EPIRB Damp Heat Test





Product Service

2.3.7 Test ResultsSummary of Aliveness test results

Stage	Pass / Fail
During Two Hour Dwell, Message 1	Pass
During Two Hour Dwell, Message 2	Pass
End Of Two Hour Dwell, Message 1	Pass
End Of Two Hour Dwell, Message 2	Pass



Product Service

Beacon Test Report (Aliveness Test, During Two Hour Dwell, Message 1)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 29-Aug-07 10:05:26 AM
Tester Model/Serial No./File Name: BT100S/1025/01666_DampHeat-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 23°C

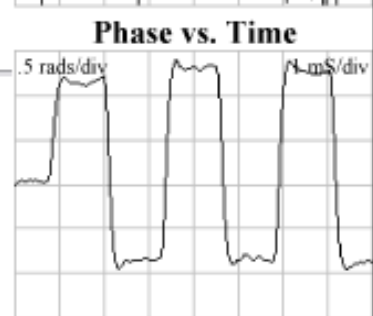
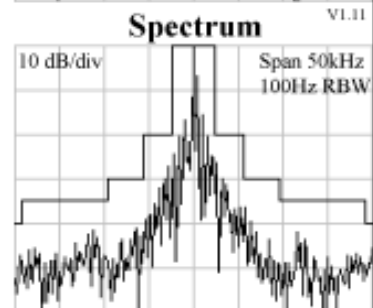
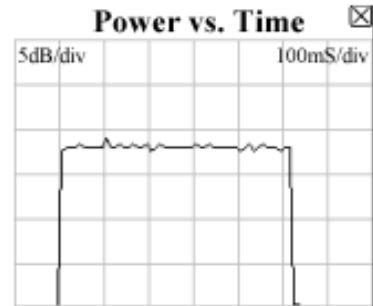
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0372 MHz
406 Power (INT ANT): 87%
Power Rise Time: < 5 ms
Phase Deviation: -0.85 +1.3 radians
Modulation Rise Time: 153 uS
Modulation Fall Time: 142 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.8 ms

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Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, During Two Hour Dwell, Message 2)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 29-Aug-07 10:11:28 AM
Tester Model/Serial No./File Name: BT100S/1025/01666_DampHeat-7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

PASS **FAIL** **INITIALS:** _____

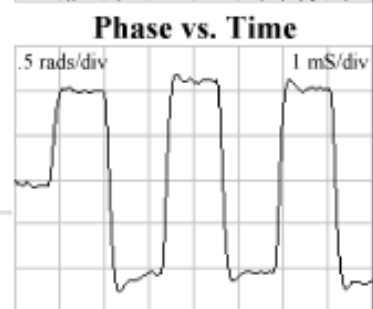
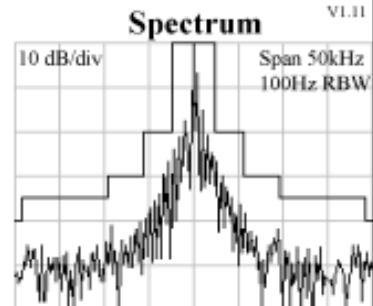
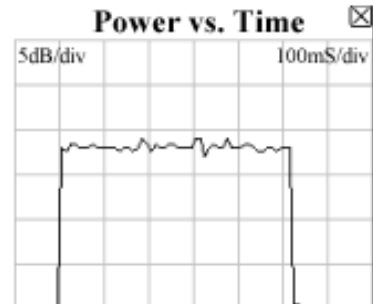
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0372 MHz
406 Power (INT ANT): 83%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.1 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.7 ms

121.5 MHz Measurements
121 Frequency (INT REF): Out of Range.
121 Power (INT ANT): 15%
Signal was unmodulated.

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Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, End Of Two Hour Dwell, Message 1)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 29-Aug-07 12:13:10 PM
Tester Model/Serial No./File Name: BT100S/1025/01666_DampHeat2-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

PASS **FAIL** **INITIALS:** _____

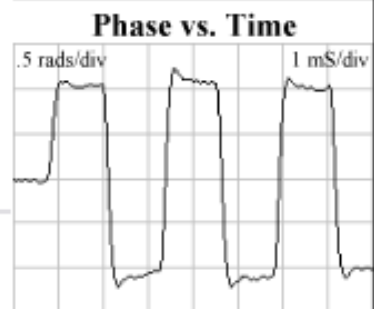
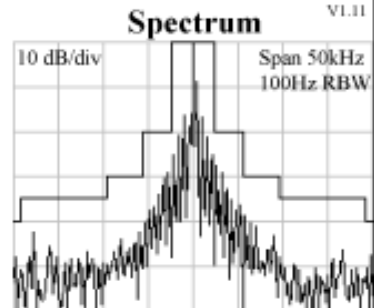
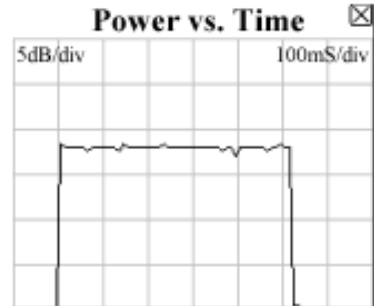
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 103%
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.08 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 153 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.8 ms

121.5 MHz Measurements
121 Frequency (INT REF): 121.5057 MHz
121 Power (INT ANT): 13%
Signal was unmodulated.

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Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, End Of Two Hour Dwell, Message 2)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 29-Aug-07 12:23:01 PM
Tester Model/Serial No./File Name: BT100S/1025/01666_DampHeat2-8
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 27°C

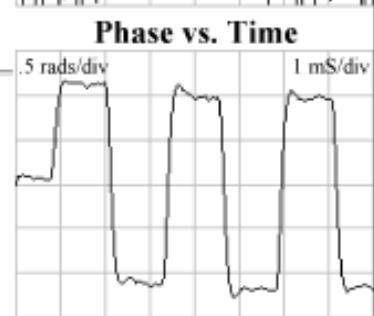
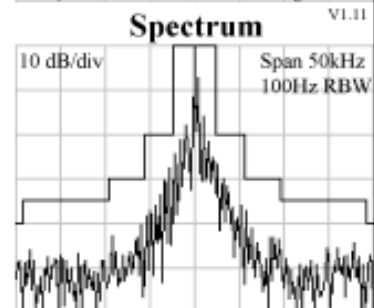
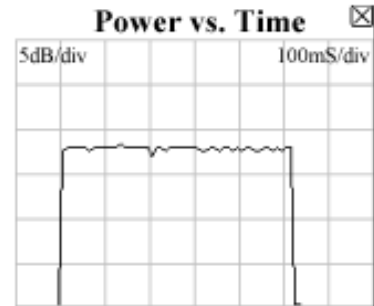
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0372 MHz
406 Power (INT ANT): 90%
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.3 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.4 VIBRATION TEST

2.4.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A5.0

2.4.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.4.3 Date of Test and Modification State

10 September 2007 - Modification State 0

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle as per "Specification Reference", above.



Test Setup

2.4.6 Environmental Conditions

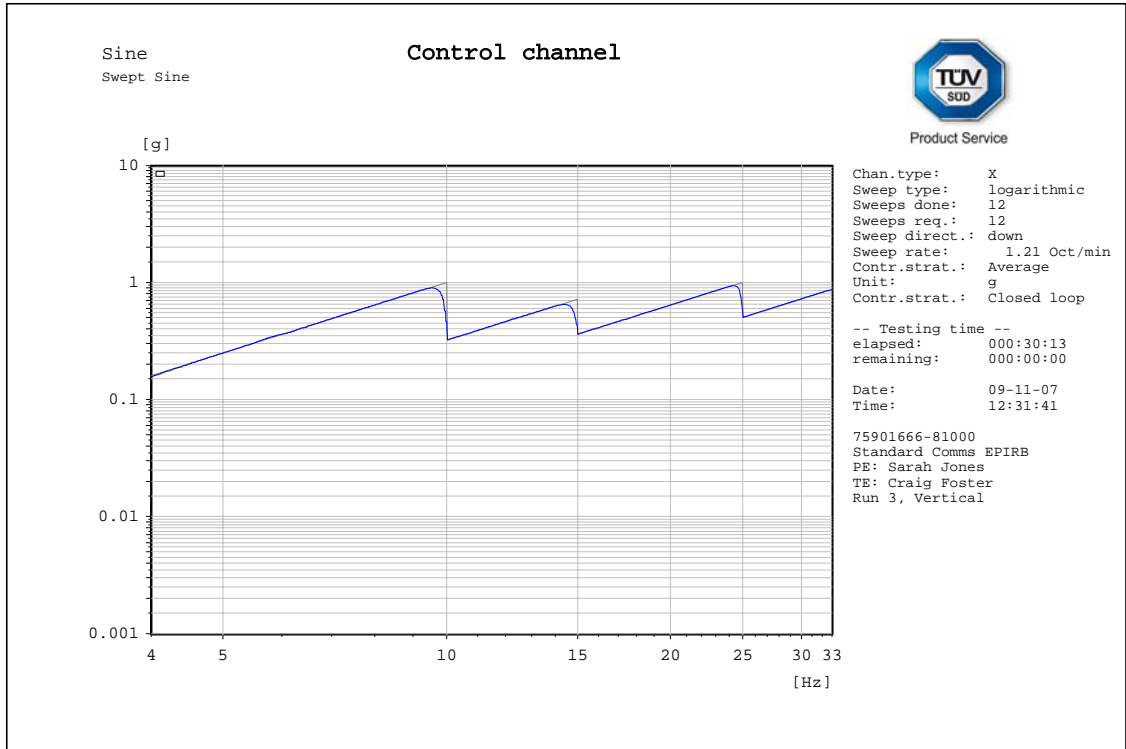
Ambient Temperature	20.9°C
Relative Humidity	42%
Atmospheric Pressure	1000mbar



Product Service

2.4.7 Test Results

Vertical axis

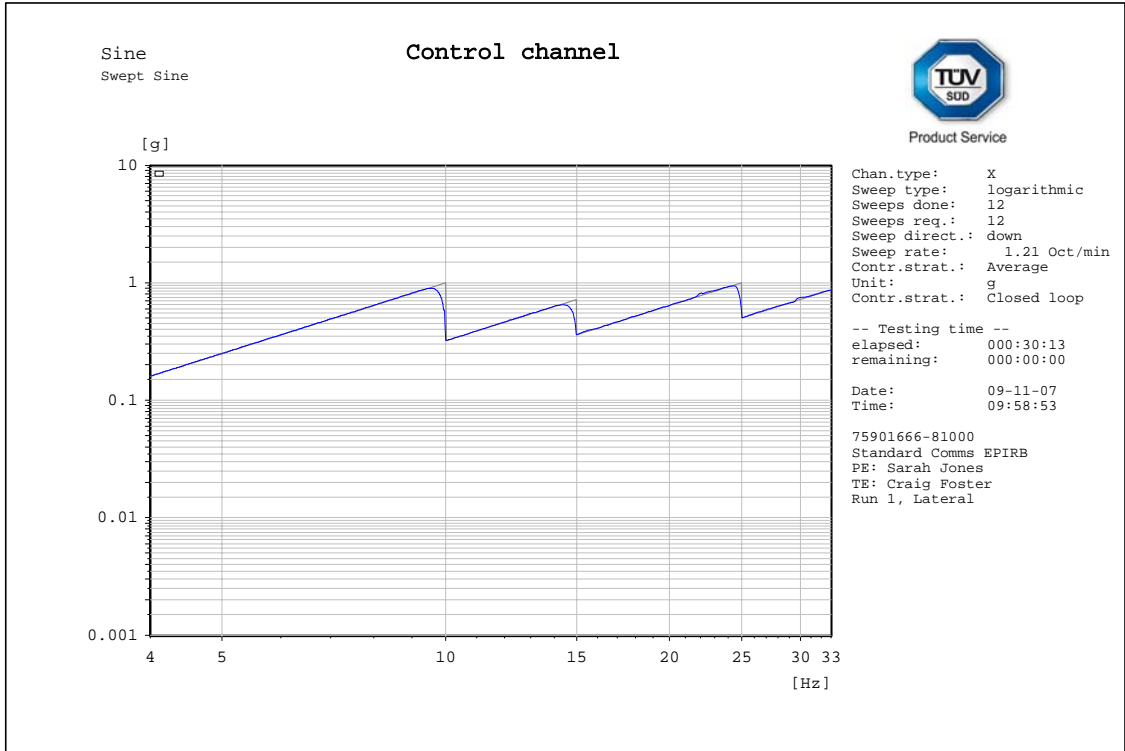


C:\VcpNT\Daten\m+p\Standard Comms\75901666-81000 EPIRB Swept Sine 009.rsn



Product Service

Lateral axis

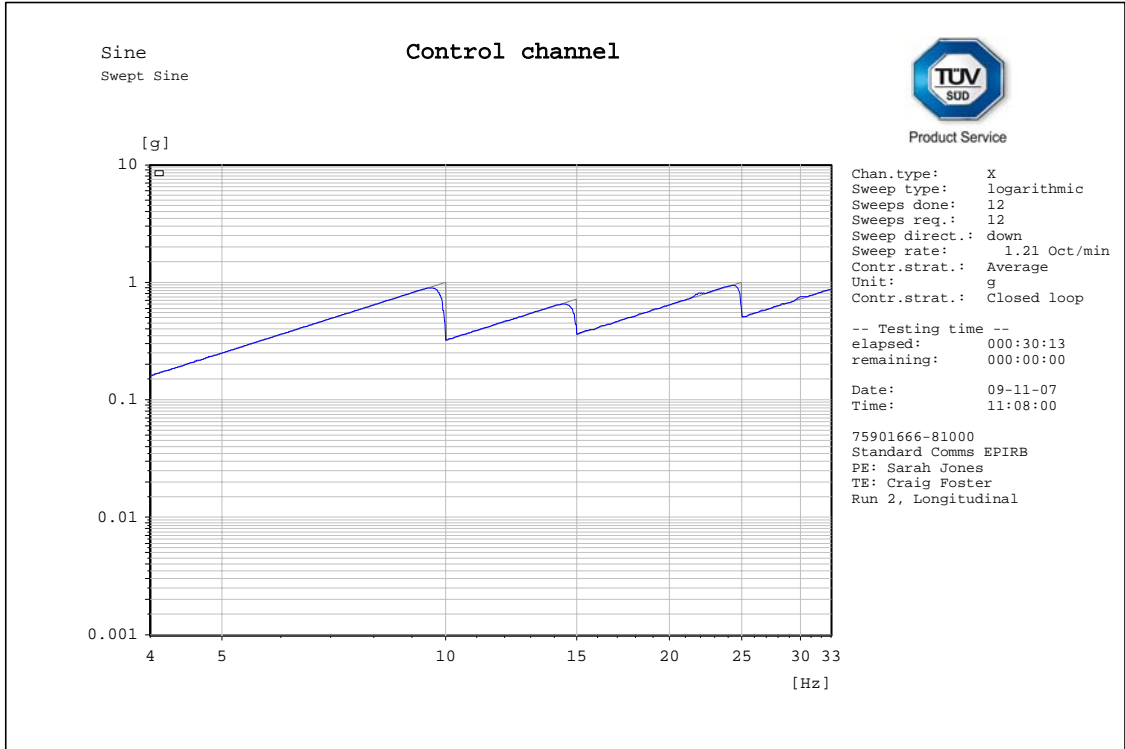


C:\VcpNT\Daten\m+p\Standard Comms\75901666-81000 EPIRB Swept Sine 003.rsn



Product Service

Longitudinal axis



C:\VcpNT\Daten\m+p\Standard Comms\75901666-81000 EPIRB Swept Sine 004.rsn



Product Service

Mechanical Inspection

Post this test no signs of mechanical degradation could be witnessed.

Summary of Aliveness test results

Stage	Pass / Fail
Post-run 1	Pass
Post-run 2	Pass
Post-run 3	Pass



Product Service

Beacon Test Report (Aliveness Test, Post-run 1)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 10-Sep-07 9:16:49 AM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vib1-8
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

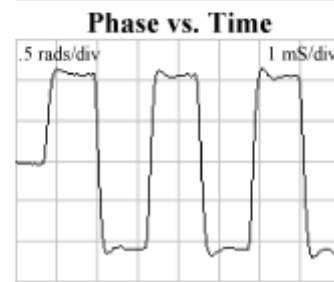
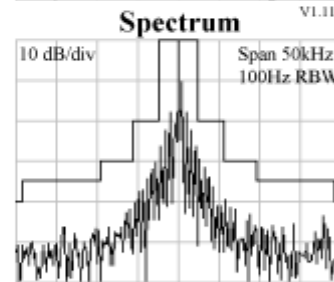
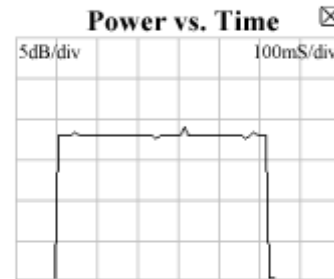
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0374 MHz
406 Power (INT ANT): 106%
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.05 radians
Modulation Rise Time: 153 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.7 bps
CW Preamble: 159.8 ms

121.5 MHz Measurements
121 Frequency (INT REF): 121.5056 MHz
121 Power (INT ANT): 28%
Sweep Direction: Downwards
Audio Frequency: 437 Hz to 1375 Hz
Sweep Range: 938 Hz
Sweep Rep Rate: 2.8 Hz
Modulation Factor: N/A
Duty Cycle: 35 %



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-run 1)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 10-Sep-07 9:11:34 AM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vib1-2
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 22°C

PASS FAIL INITIALS: _____

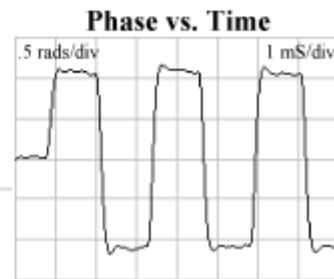
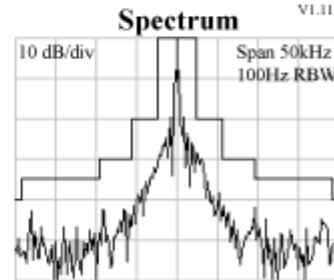
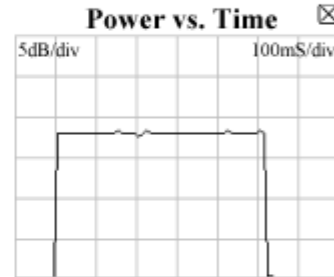
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 83%
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.09 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.6 ms

121.5 MHz Measurements
121 Frequency (INT REF): Detected.
121 Power (INT ANT): 21%
Signal was unmodulated.

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-run 2)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 10-Sep-07 2:24:02 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vib2-7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

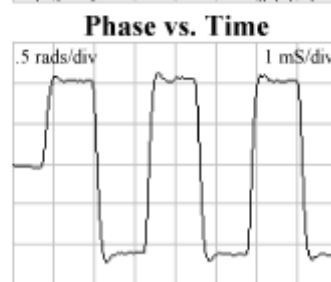
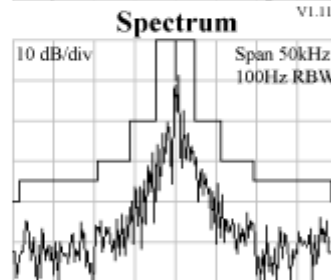
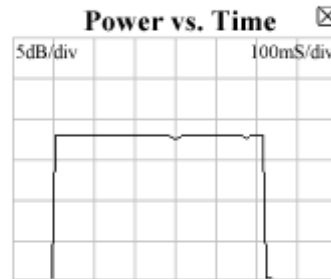
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0374 MHz
406 Power (INT ANT): 94%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.05 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.7 bps
CW Preamble: 160.1 ms

121.5 MHz Measurements
121 Frequency (INT REF): 121.5056 MHz
121 Power (INT ANT): 36%
Sweep Direction: Downwards
Audio Frequency: 437 Hz to 1437 Hz
Sweep Range: 1000 Hz
Sweep Rep Rate: 2.8 Hz
Modulation Factor: N/A
Duty Cycle: 35 %



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Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-run 2)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 10-Sep-07 2:19:35 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vib2-2
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 23°C

PASS FAIL INITIALS: _____

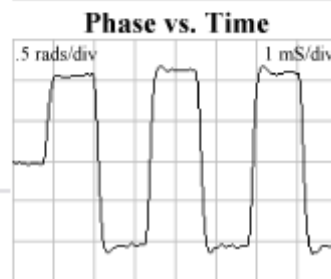
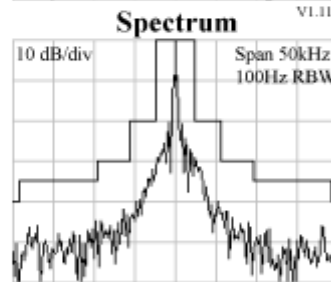
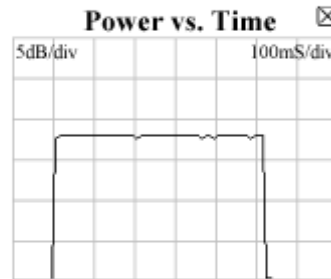
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 94%
Power Rise Time: < 5 ms
Phase Deviation: -1.06 +1.12 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 153 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.7 ms

121.5 MHz Measurements
121 Frequency (INT REF): Detected.
121 Power (INT ANT): 28%
Signal was unmodulated.

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-run 3)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 11-Sep-07 10:25:33 AM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vib4-7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 22°C

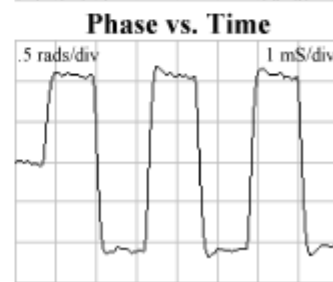
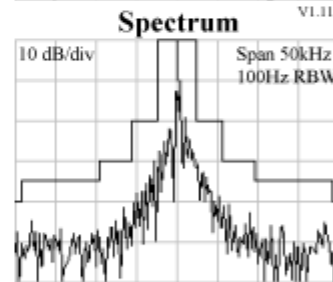
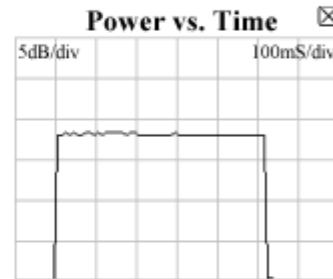
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0374 MHz
406 Power (INT ANT): 174%
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.06 radians
Modulation Rise Time: 153 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 1.6%
Modulation Bit Rate: 399.7 bps
CW Preamble: 158.6 ms

121.5 MHz Measurements
121 Frequency (INT REF): 121.5056 MHz
121 Power (INT ANT): 34%
Sweep Direction: Downwards
Audio Frequency: 437 Hz to 1375 Hz
Sweep Range: 938 Hz
Sweep Rep Rate: 2.8 Hz
Modulation Factor: N/A
Duty Cycle: 35 %



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-run 3)

Beacon Test Report
ID1E41FF3F81FE0

Organization:
Tested By:
Date: 11-Sep-07 9:18:31 AM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vid3-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 19°C

PASS FAIL INITIALS: _____

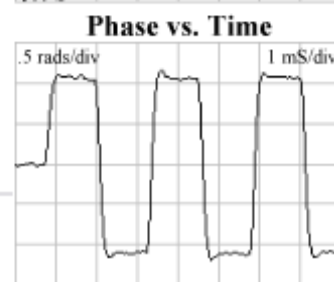
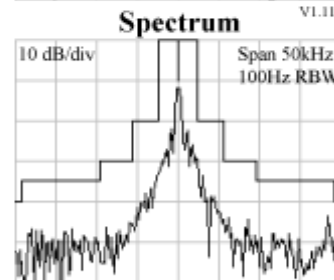
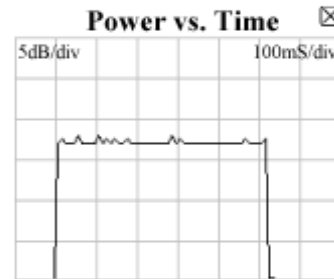
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 178%
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.06 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.7 bps
CW Preamble: 158.3 ms

121.5 MHz Measurements
121 Frequency (INT REF): Detected.
121 Power (INT ANT): 25%
Signal was unmodulated.

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 11-Sep-07 4:35:25 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vib7-7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

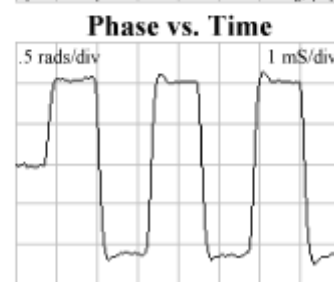
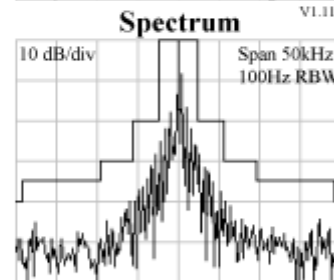
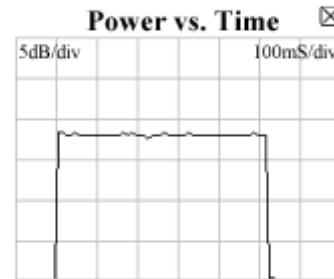
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 174%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.01 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.7 bps
CW Preamble: 159.9 ms

121.5 MHz Measurements
121 Frequency (INT REF): 121.5056 MHz
121 Power (INT ANT): 41%
Sweep Direction: Downwards
Audio Frequency: 62 Hz to 1375 Hz
Sweep Range: 1313 Hz
Sweep Rep Rate: 4.2 Hz
Modulation Factor: N/A
Duty Cycle: 33 %



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 11-Sep-07 4:31:25 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-Vib7-2
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

PASS FAIL INITIALS: _____

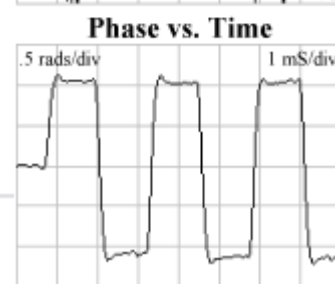
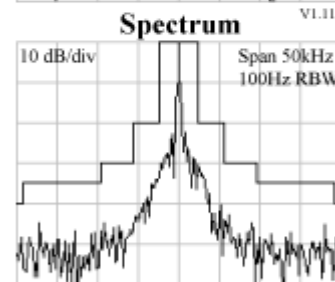
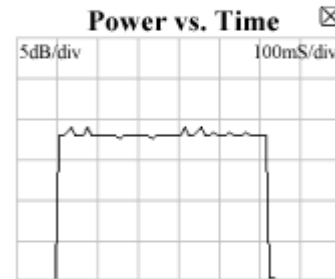
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 105%
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.02 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.7 bps
CW Preamble: 160 ms

121.5 MHz Measurements
121 Frequency (INT REF): Detected.
121 Power (INT ANT): 29%
Signal was unmodulated.

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.5 BUMP TEST**2.5.1 Specification Reference**

RTCM Paper 77-2002/SC110-STD, Clause A6.0

2.5.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.5.3 Date of Test and Modification State

12 September 2008 - Modification State 0

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle

2.5.6 Environmental Conditions

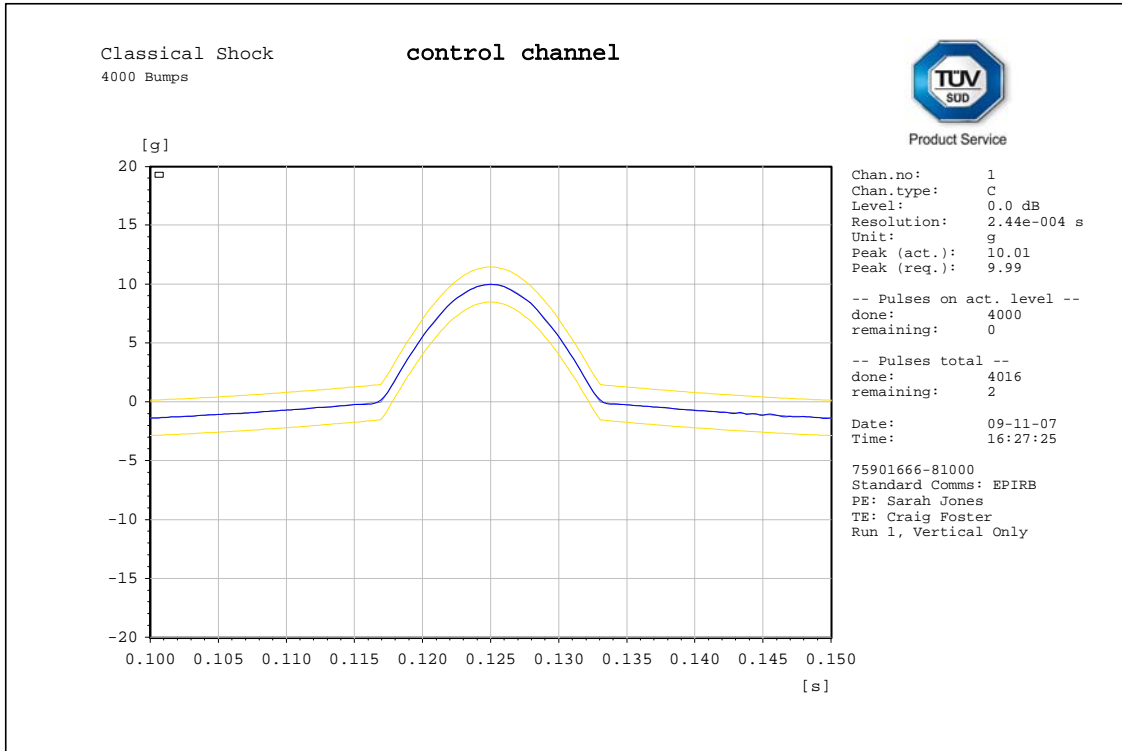
Ambient Temperature	23.4°C
Relative Humidity	41%
Atmospheric Pressure	1022mbar



Product Service

2.5.7 Test Results

Vertical axis, 4000 Bumps



Mechanical Inspection

Post this test no signs of mechanical degradation could be witnessed.



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report

193400003F81FE0

Organization:

Tested By:

Date: 09-Nov-07 4:08:30 PM

Tester Model/Serial No./File Name: BT100S/1025/bibble-1

Tester Cal Due Date: Nov 10, 2006

Tester Temperature: 23°C



PASS



FAIL

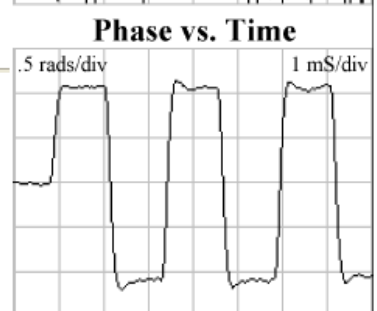
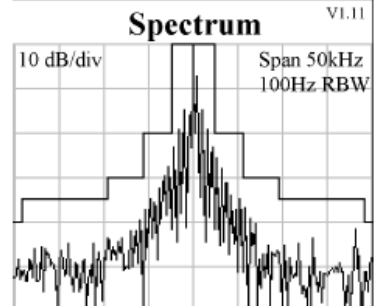
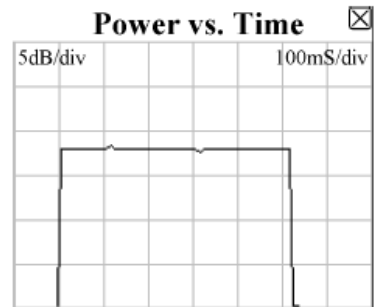
INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 193400003F81FE0
Full Hex: FFFE2F8C9A00001FC0FF021F5DB79F3C0010
Burst Mode: Normal Mode (Long)
Protocol: EPIRB NLP Protocol
Country 201: Albania
National ID #: 0
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (5 Watt): 33.5 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.06 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.6 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.6 SALT FOG TEST

2.6.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A7.0

2.6.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.6.3 Date of Test and Modification State

17 September 2007 - Modification State 0

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle



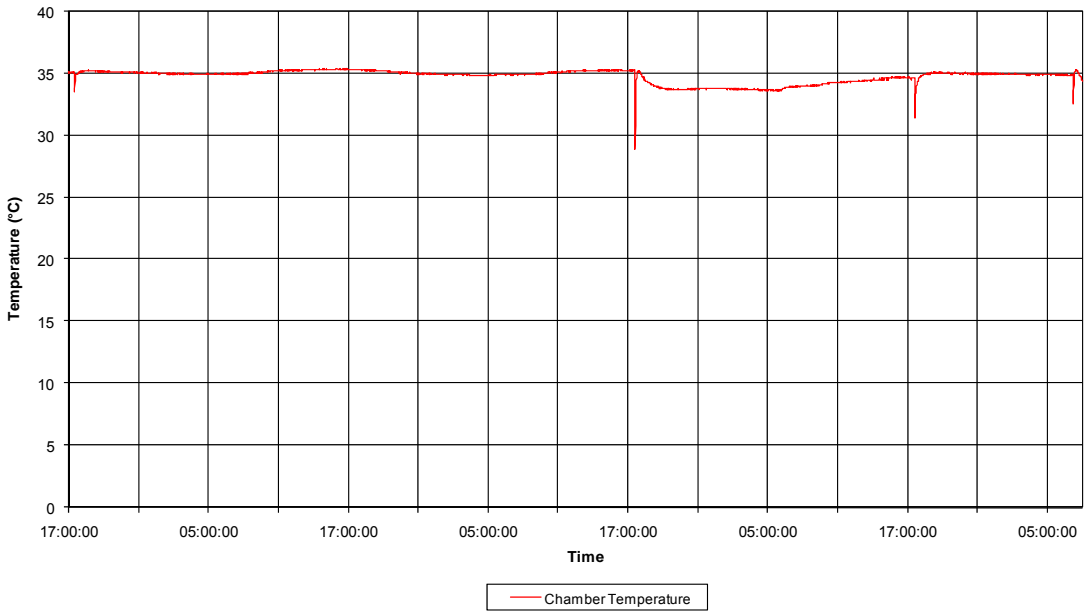
Test Set-up



2.6.6 Environmental Conditions

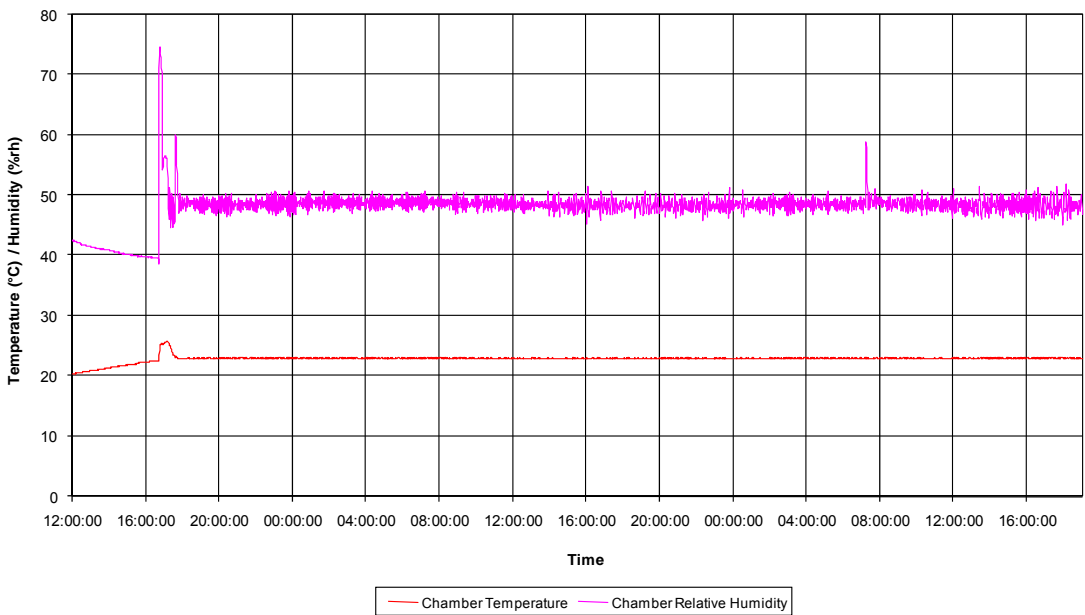
Salt Spray Temperature Plot

Salt Spray 12-09-07 to 16-09-07



Ambient Storage Temperature Plot

Salt Storage 14-09-07 to 16-09-07





Product Service

2.6.7 Test Results

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
ID1E41FF3F81FE0

Organization:
Tested By:
Date: 16-Sep-07 6:00:17 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-Post-Salt-3
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

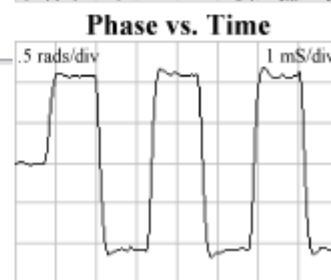
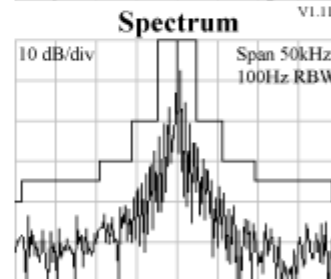
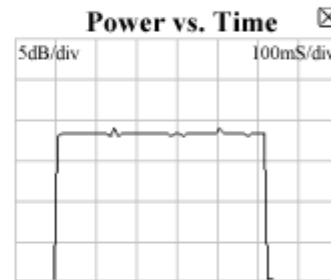
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 96%
Power Rise Time: < 5 ms
Phase Deviation: -1.07 +1.09 radians
Modulation Rise Time: 153 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.6%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.9 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
ID1E41FF3F81FE0

Organization:
Tested By:
Date: 16-Sep-07 5:58:28 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-Post-Salt-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 23°C

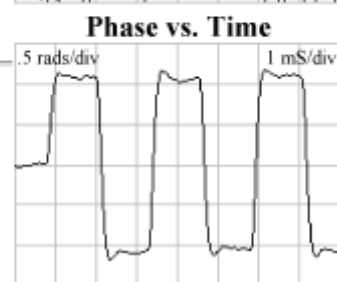
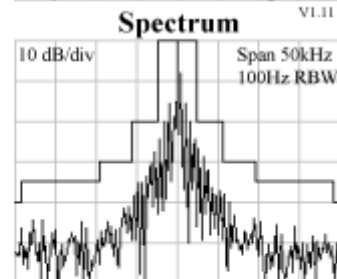
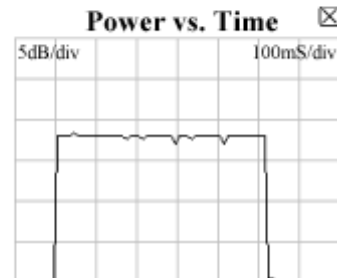
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 95%
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.06 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.8 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.7 DROP TEST (ON HARD SURFACE)**2.7.1 Specification Reference**

RTCM Paper 77-2002/SC110-STD, Clause A8.1

2.7.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.7.3 Date of Test and Modification State

20 September 2007 - Modification State 0

2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle

2.7.6 Test Results

EUT placed in chamber set to -30°C, and stabilised for a minimum of 2 hours.

The test piece was removed and the Drop-test was performed as follows:

- 1 drop from a height of 1 metre onto the test surface

On completion M Hardy tested the EUT and reported it as satisfactory.



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 20-Sep-07 2:20:15 PM
Tester Model/Serial No./File Name: BT100S/1025/0166-harddrop-2
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 23°C

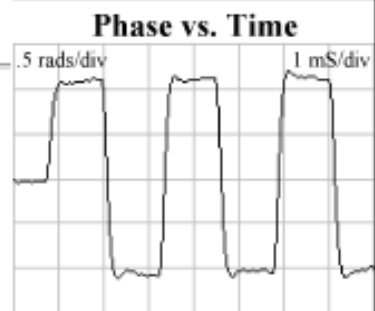
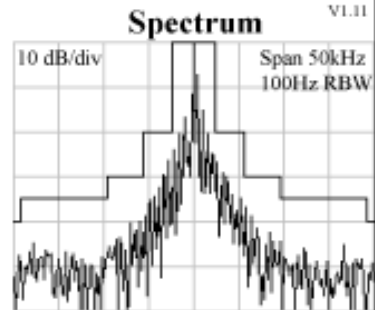
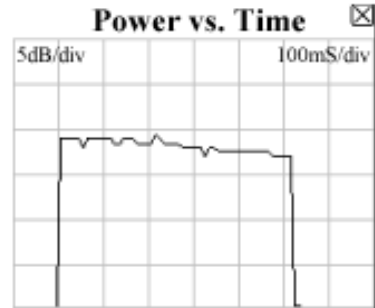
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 84%
Power Rise Time: < 5 ms
Phase Deviation: -1.06 +1.1 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 160.3 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 20-Sep-07 2:21:28 PM
Tester Model/Serial No./File Name: BT100S/1025/0166-harddrop-3
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

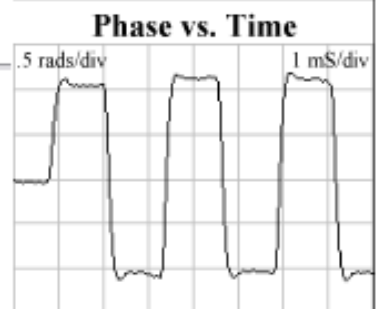
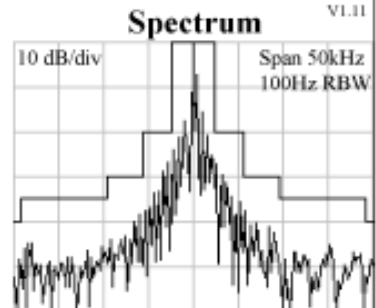
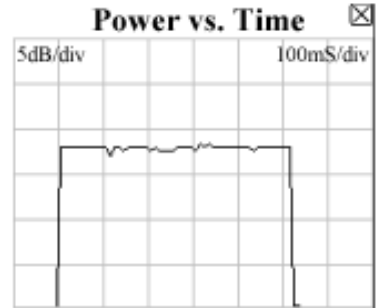
PASS **FAIL** **INITIALS:** _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 73%
Power Rise Time: < 5 ms
Phase Deviation: -1.05 +1.12 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.9 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.8 DROP TEST (IN WATER)

2.8.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A8.2

2.8.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.8.3 Date of Test and Modification State

18 September 2007 - Modification State 0

2.8.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle*

*Note: EUT activated (entered Operating mode automatically) on contact with water.

2.8.6 Test Results

Summary of Aliveness test results

Stage	Pass / Fail
Pre-Upright Test	Pass
Post-Upright Test	Pass
Pre-Inverted Test	Pass
Post-Inverted Test	Pass
Pre-Horizontal Test	Pass
Post-Horizontal Test	Pass



Product Service

Beacon Test Report (Aliveness Test, Post-Upright Test)

Beacon Test Report
1D1E41FF3F81FE0

Organization: TUV Product Service
 Tested By: BT100A S/N: 2383
 Date: 18/09/07 9:19:56 AM
 Tester Model/Serial No./File Name: BT100S/2383/std com-6
 Tester Cal Due Date: Sep 6, 2008
 Tester Temperature: 17°C

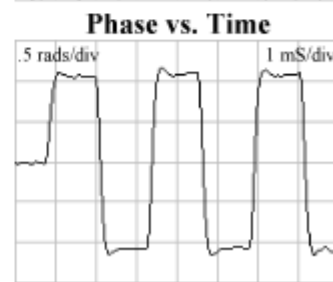
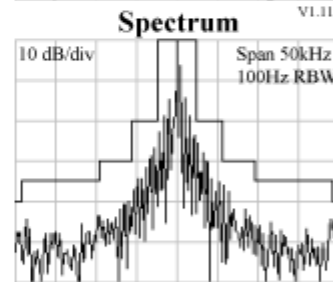
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
 Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
 Burst Mode: Normal Mode (Long)
 Protocol: National Test Protocol
 Country 232: United Kingdom
 National ID #: 33790
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-109: Default
 National Use: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0371 MHz
 406 Power (INT ANT): 88%
 Power Rise Time: < 5 ms
 Phase Deviation: -1.08 +1.08 radians
 Modulation Rise Time: 165 uS
 Modulation Fall Time: 165 uS
 Modulation Symmetry: 1.2%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 160.7 ms

121.5 MHz Measurements
 121 Frequency (INT REF): 121.5064 MHz
 121 Power (INT ANT): 68%
 Sweep Direction: Downwards
 Audio Frequency: 437 Hz to 1375 Hz
 Sweep Range: 938 Hz
 Sweep Rep Rate: 2.8 Hz
 Modulation Factor: 84 %
 Duty Cycle: 36 %



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Product Service

Beacon Test Report (Aliveness Test, Post-Inverted Test)

Beacon Test Report
1D1E41FF3F81FE0

Organization: TUV Product Service
 Tested By: BT100A S/N: 2383
 Date: 18/09/07 9:30:12 AM
 Tester Model/Serial No./File Name: BT100S/2383/std.com-7
 Tester Cal Due Date: Sep 6, 2008
 Tester Temperature: 16°C

PASS **FAIL** **INITIALS:** _____

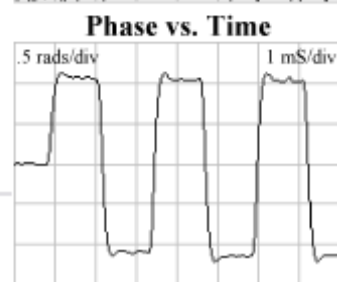
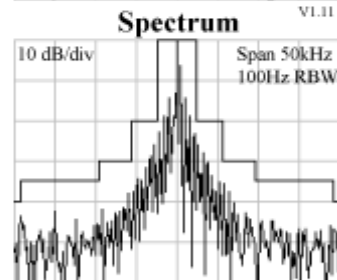
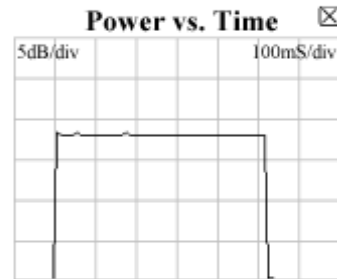
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
 Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
 Burst Mode: Self Test Mode (Long)
 Protocol: National Test Protocol
 Country 232: United Kingdom
 National ID #: 33790
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-109: Default
 National Use: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.037 MHz
 406 Power (INT ANT): 86%
 Power Rise Time: < 5 ms
 Phase Deviation: -1.09 +1.05 radians
 Modulation Rise Time: 188 uS
 Modulation Fall Time: 188 uS
 Modulation Symmetry: 1.2%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 161 ms

121.5 MHz Measurements
 121 Frequency (INT REF): 121.5063 MHz
 121 Power (INT ANT): 73%
 Signal was unmodulated.

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.





Product Service

Beacon Test Report (Aliveness Test, Post-Horizontal Test)

Beacon Test Report
1D1E41FF3F81FE0

Organization: TUV Product Service
 Tested By: BT100A S/N: 2383
 Date: 18/09/07 9:30:12 AM
 Tester Model/Serial No./File Name: BT100S/2383/std com-7
 Tester Cal Due Date: Sep 6, 2008
 Tester Temperature: 16°C

PASS FAIL INITIALS: _____

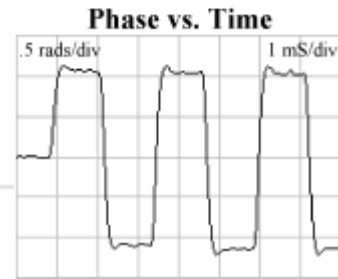
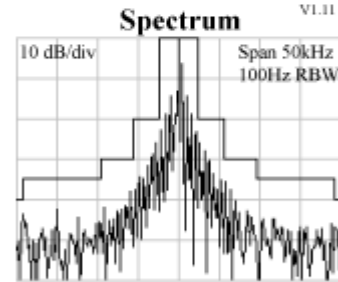
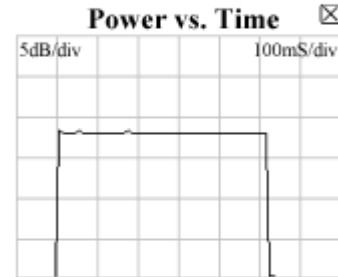
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
 Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
 Burst Mode: Self Test Mode (Long)
 Protocol: National Test Protocol
 Country 232: United Kingdom
 National ID #: 33790
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-109: Default
 National Use: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.037 MHz
 406 Power (INT ANT): 86%
 Power Rise Time: < 5 ms
 Phase Deviation: -1.09 +1.05 radians
 Modulation Rise Time: 188 uS
 Modulation Fall Time: 188 uS
 Modulation Symmetry: 1.2%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 161 ms

121.5 MHz Measurements
 121 Frequency (INT REF): 121.5063 MHz
 121 Power (INT ANT): 73%
 Signal was unmodulated.

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Product Service

2.9 LEAKAGE AND IMMERSION TEST

2.9.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A9.0

2.9.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.9.3 Date of Test and Modification State

05 October 2007 - Modification State 1

2.9.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.9.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle*

*Note: EUT activated (entered Operating mode automatically) on contact with water.



Test Set-up



Product Service

2.9.6 Test Results

03 October 2007

The EUT was placed in the climatic chamber and preconditioned at a temperature of +65°C for 1 hour.

The EUT was located into the pressure vessel which had been filled with water (water temperature 19.6°C). The unit activated the moment it was immersed. The unit was prevented from floating to the surface with the use of two 10kg masses as seen in Test Setup, above.

05 October 2007

48 hours after immersion the pressure was increased to +981 mbar (relative to atmospheric pressure) and maintained for a duration of 5 minutes.

- An Aliveness Test was conducted (see Beacon Test Report, below).



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
ID1E41FF3F81FE0

Organization:
Tested By:
Date: 05-Oct-07 3:04:26 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-pressure-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 23°C

PASS FAIL INITIALS: _____

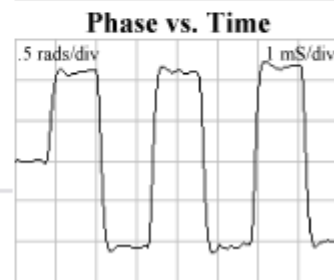
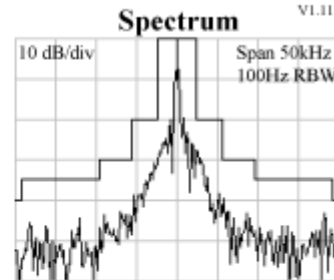
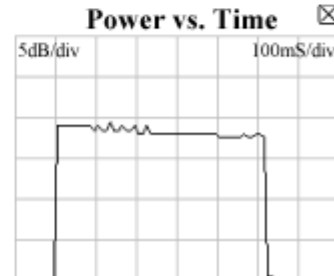
Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 66%
Power Rise Time: < 5 ms
Phase Deviation: -1.07 +1.1 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.8 ms

121.5 MHz Measurements
121 Frequency (INT REF): Detected.
121 Power (INT ANT): 15%
Signal was unmodulated.

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 05-Oct-07 3:08:27 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-pressure-5
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 27°C

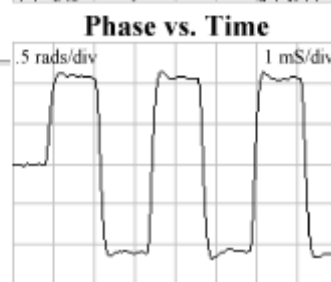
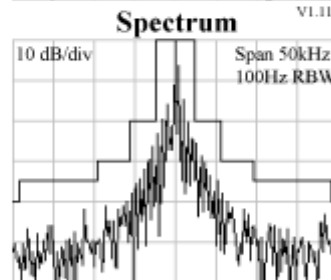
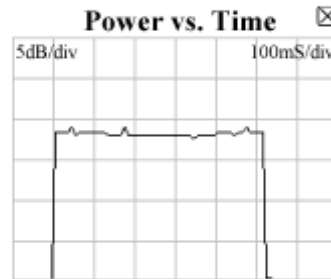
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 49%
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.07 radians
Modulation Rise Time: 153 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 160 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.10 SPURIOUS EMISSIONS TEST

2.10.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A10.0

2.10.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.10.3 Date of Test and Modification State

406 MHz Test at +55°C, -20°C and Ambient: 19 October 2007 - Modification State 1
 121 MHz Test at +55°C and -20°C: 04 February 2008 - Modification State 2
 121 MHz Test at Ambient: 25 February 2008 - Modification State 2

2.10.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.10.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Operating

2.10.6 Environmental Conditions

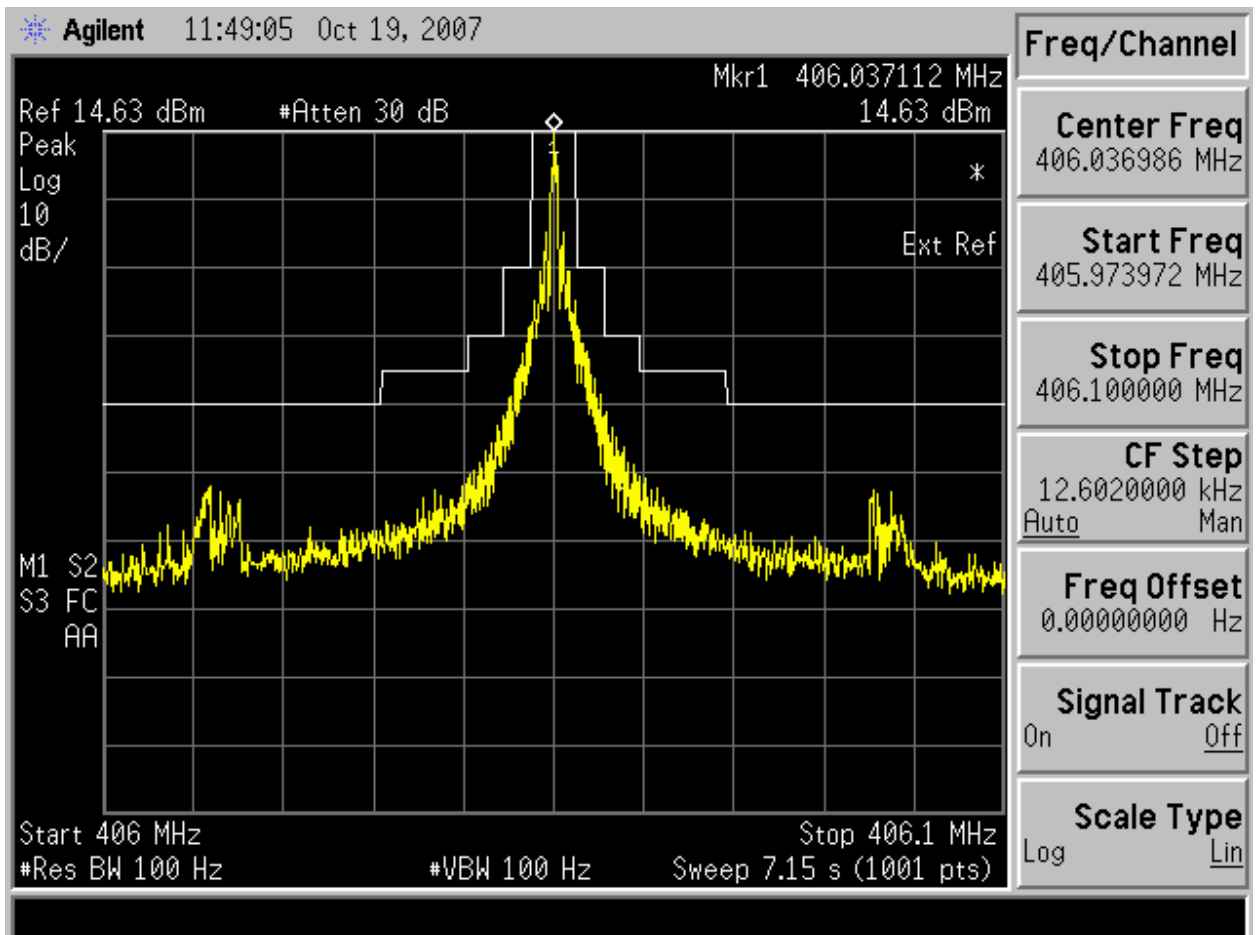
	19 October 2007	04 February 2008	20 February 2008
Ambient Temperature	23.8°C	23.4°C	24.2°C
Atmospheric Pressure	1004mbar	999mbar	1008mbar



Product Service

2.10.7 Test Results

Combined 406 MHz Test at +55°C, -20°C and Ambient

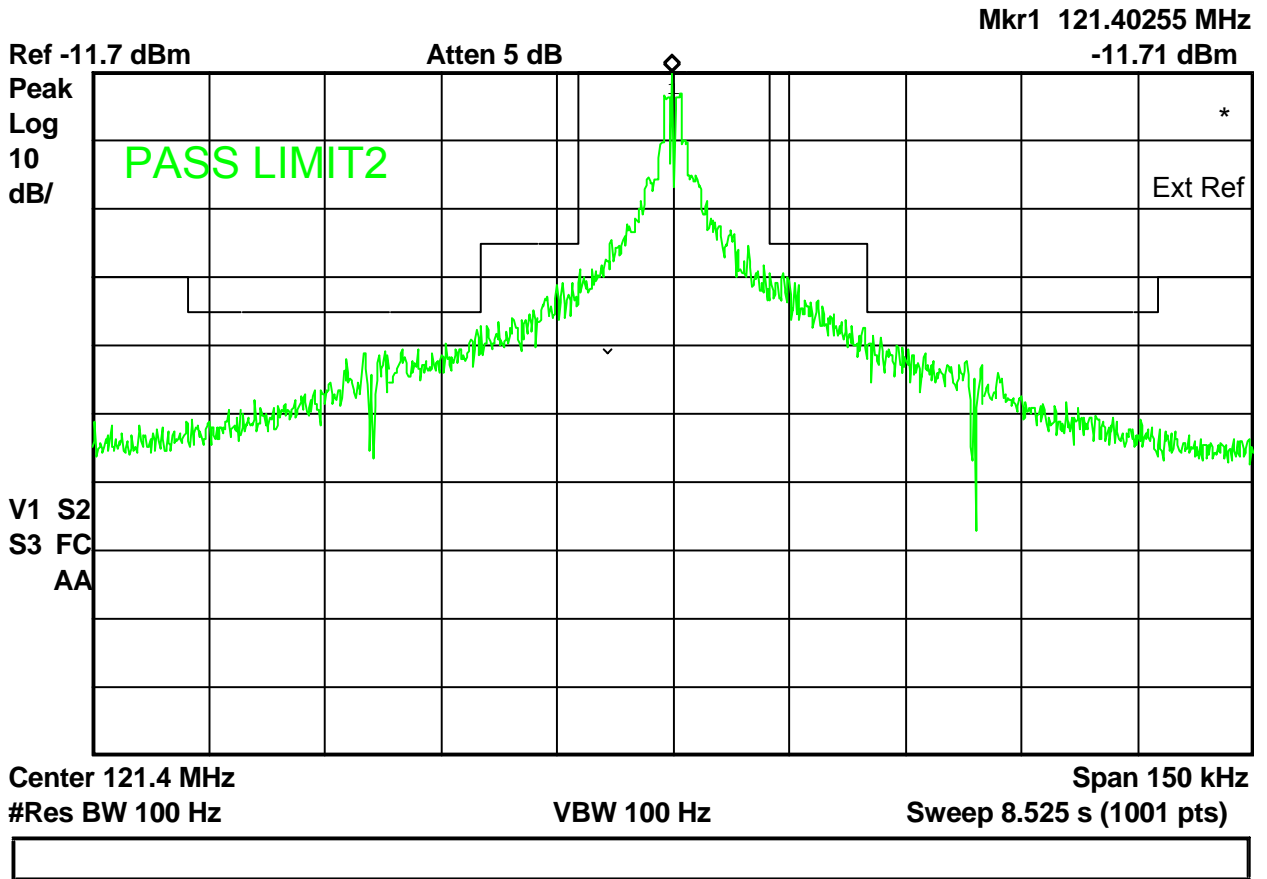




Product Service

121 MHz Test at +55°C

Agilent 13:38:53 Feb 4, 2008



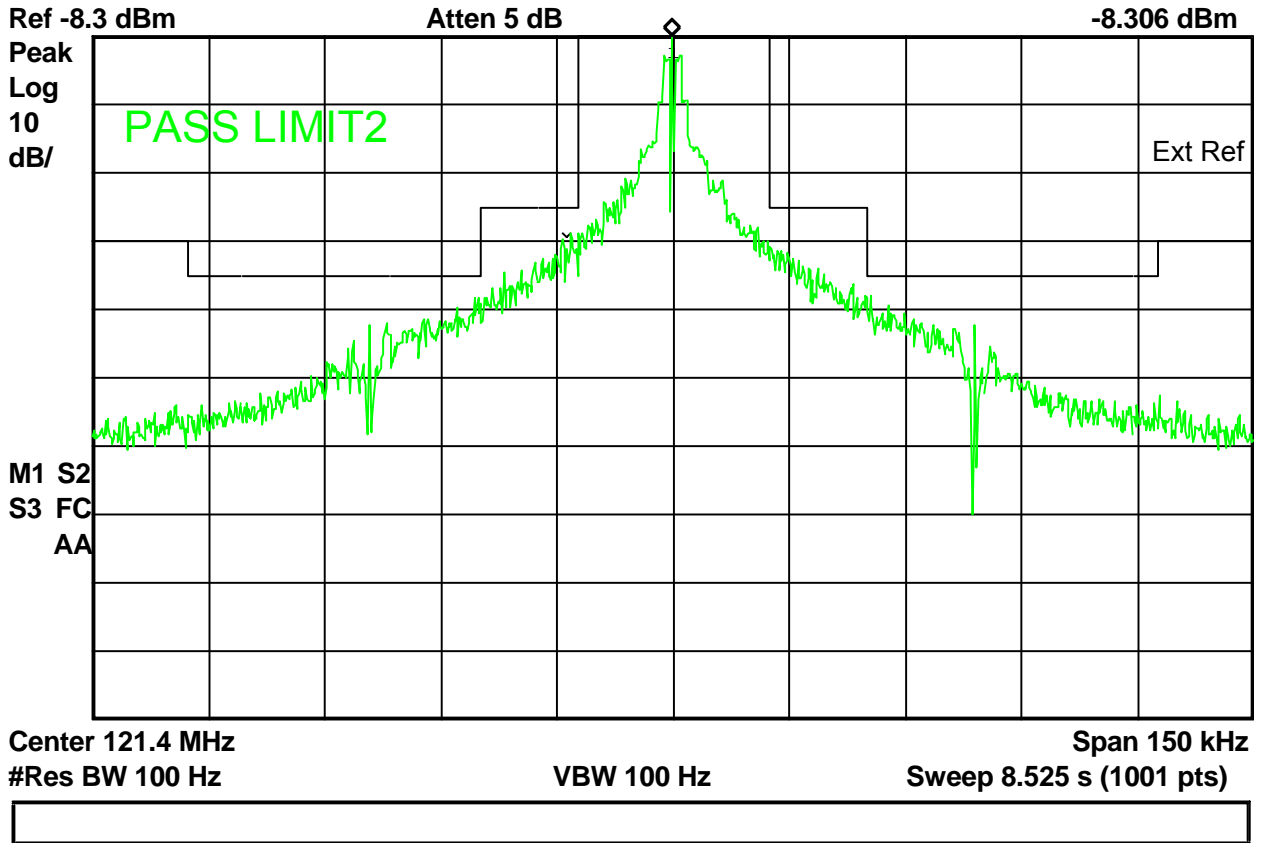


Product Service

121 MHz Test at -20°C

Agilent 16:20:50 Feb 4, 2008

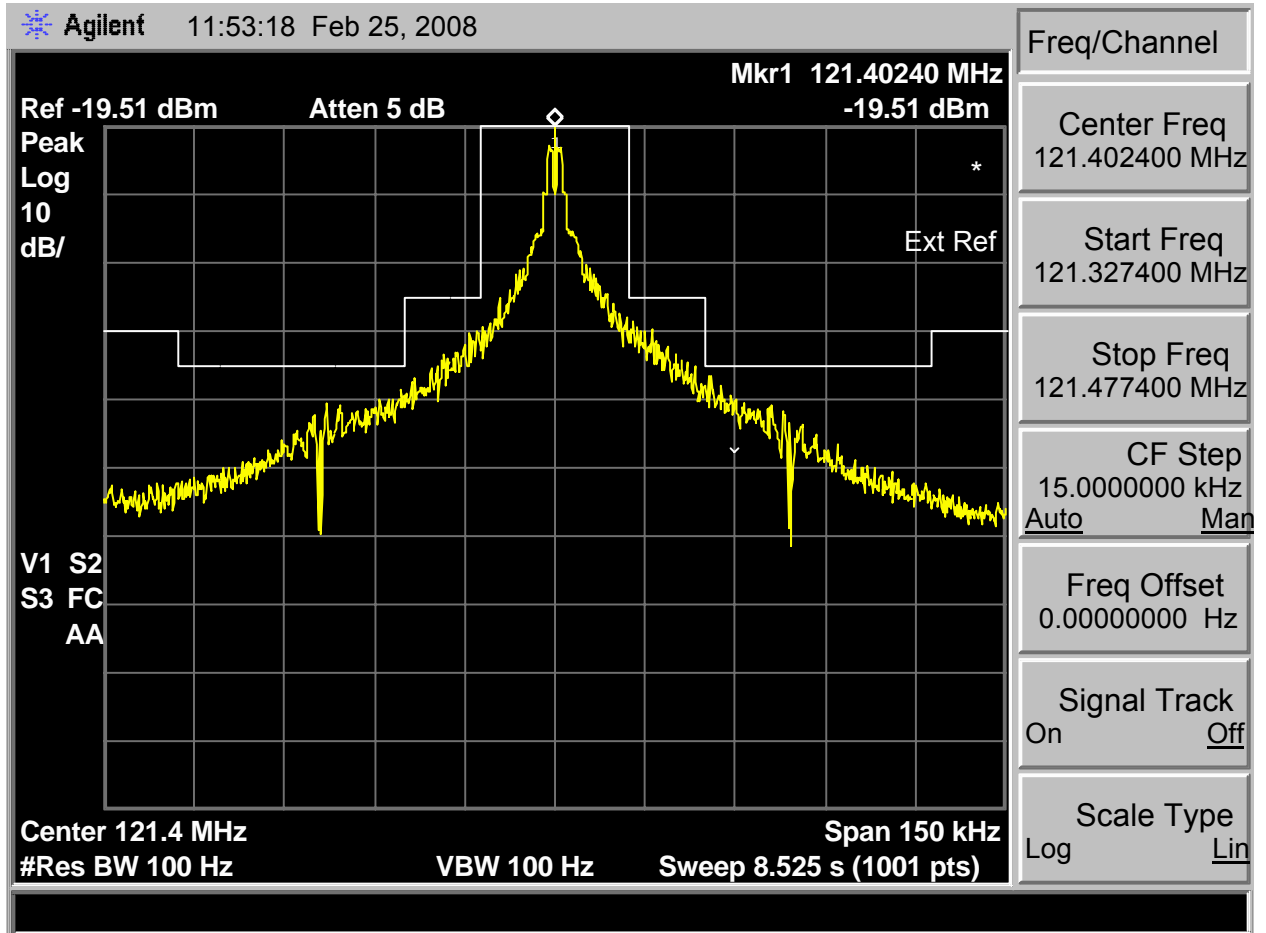
Mkr1 121.40045 MHz
-8.306 dBm





Product Service

121 MHz Test at Ambient





Product Service

2.11 LOW-TEMPERATURE THERMAL SHOCK TEST

2.11.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A11.1

2.11.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.11.3 Date of Test and Modification State

08 October 2007 - Modification State 1

2.11.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.11.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle ("Ready Condition")*

*Note: EUT activated (entered Operating mode automatically) on contact with water.



Test Set-up – Preconditioning



Product Service

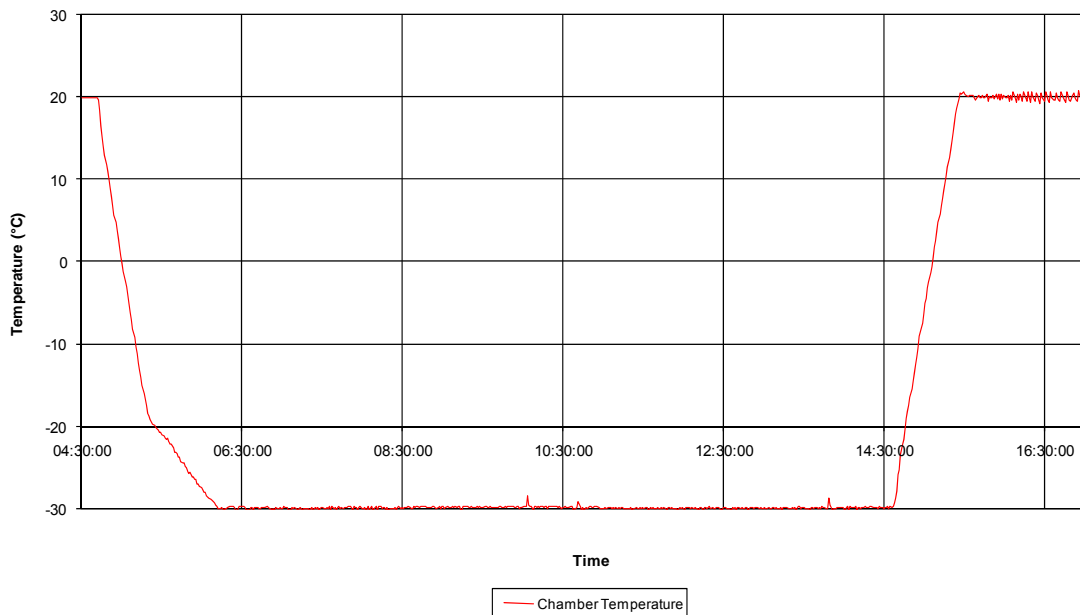


Test Set-up – During Test

2.11.6 Environmental Conditions

Preconditioning Temperature Plot

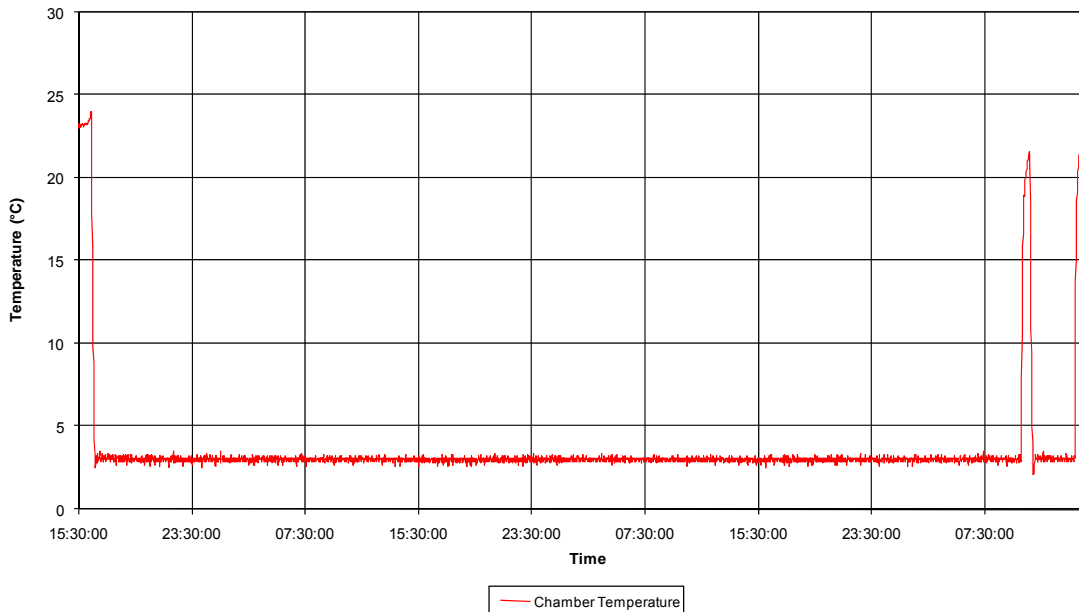
Instron 08-10-07





Water Conditioning Temperature Plot

Climatec 1 05-10-07 to 08-10-07



2.11.7 Test Results

EUT set to the Ready Condition and placed in the climatic chamber set to -30°C for a stabilisation of at least 3 hours.

EUT removed from chamber and totally immersed in fresh water at 2.3°C for 10 seconds then allowed to float in the same water for a further 5 minutes. EUT self-activated immediately as it was immersed and an Aliveness Test was performed, see Beacon Test Report below.

EUT removed from water, dried and deactivated automatically then set to the Ready condition then replaced in the climatic chamber, chamber temperature still -30°C .

EUT removed from chamber after stabilisation of at least 3 hours and totally immersed in salt water at 1.5°C for 10 seconds then allowed to float in the same water. EUT self-activated immediately as it was immersed and an Aliveness Test was performed, see Beacon Test Report below.

After 20 minutes the following measurements were conducted (results can be found in the Test Results Table, starting on page 17):

- Short-term frequency stability
- Medium-term frequency stability
 - Mean slope
 - Residual frequency variation

EUT was removed from water, dried and deactivated.



Product Service

Beacon Test Report (Aliveness Test, In Fresh Water)

Beacon Test Report
ID1E41FF3F81FE0

Organization:
 Tested By:
 Date: 08-Oct-07 10:35:12 AM
 Tester Model/Serial No./File Name: BT100S/1025/01666-lwtmptthrlmshock-39
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 25°C

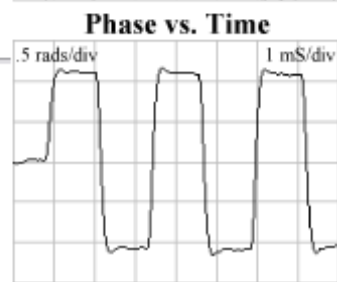
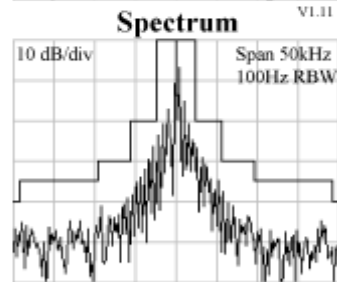
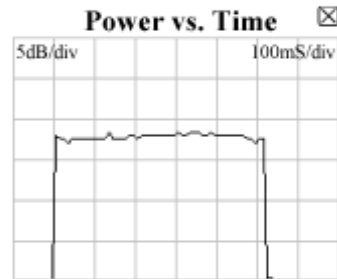
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
 Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
 Burst Mode: Normal Mode (Long)
 Protocol: National Test Protocol
 Country 232: United Kingdom
 National ID #: 33790
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-109: Default
 National Use: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0373 MHz
 406 Power (INT ANT): 70%
 Power Rise Time: < 5 ms
 Phase Deviation: -1.07 +1.1 radians
 Modulation Rise Time: 177 uS
 Modulation Fall Time: 165 uS
 Modulation Symmetry: 1.2%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 157.1 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, In Fresh Water)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
 Tested By:
 Date: 08-Oct-07 10:36:55 AM
 Tester Model/Serial No./File Name: BT100S/1025/01666-lwtmpthrmlshock-slfst-1
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 25°C

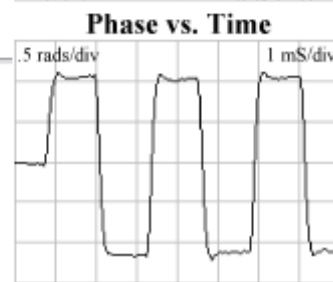
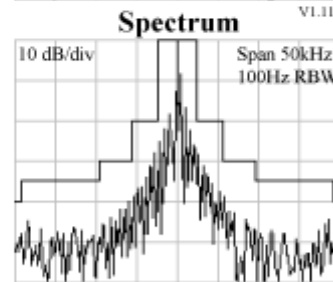
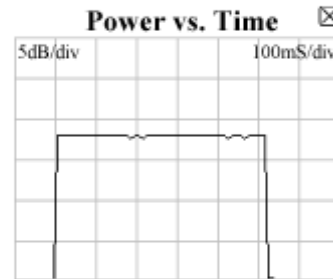
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
 Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
 Burst Mode: Self Test Mode (Long)
 Protocol: National Test Protocol
 Country 232: United Kingdom
 National ID #: 33790
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-109: Default
 National Use: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0372 MHz
 406 Power (INT ANT): 98%
 Power Rise Time: < 5 ms
 Phase Deviation: -1.16 +1.02 radians
 Modulation Rise Time: 177 uS
 Modulation Fall Time: 188 uS
 Modulation Symmetry: 0.8%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 159.6 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, In Salt Water)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 08-Oct-07 1:53:49 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-lwtmpthrmlshock-salt-7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 28°C

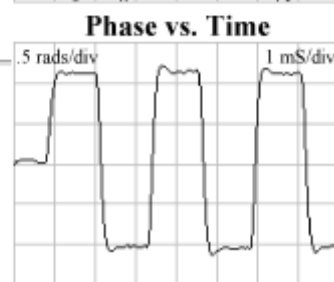
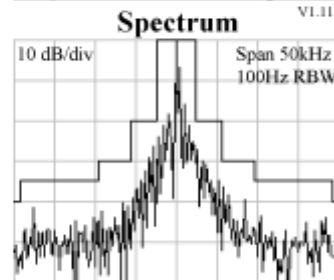
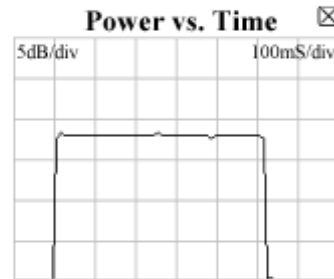
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0374 MHz
406 Power (INT ANT): 71%
Power Rise Time: < 5 ms
Phase Deviation: -1.03 +1.14 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.2 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, In Salt Water)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 08-Oct-07 1:57:21 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-lwtmp-salt-sltfst-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

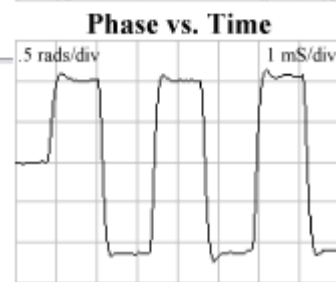
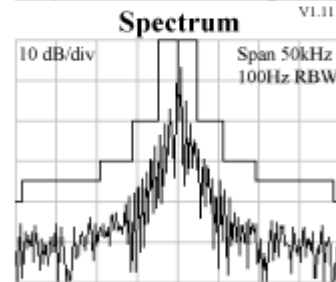
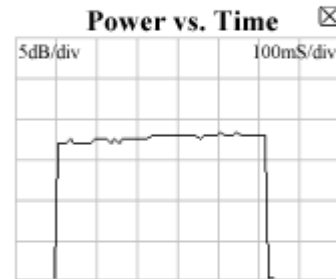
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0372 MHz
406 Power (INT ANT): 78%
Power Rise Time: < 5 ms
Phase Deviation: -1.14 +1.01 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.2 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.12 HIGH-TEMPERATURE THERMAL SHOCK TEST

2.12.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A11.1

2.12.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.12.3 Date of Test and Modification State

10 October 2007 - Modification State 1

2.12.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.12.5 Test Set-up and Operating Modes

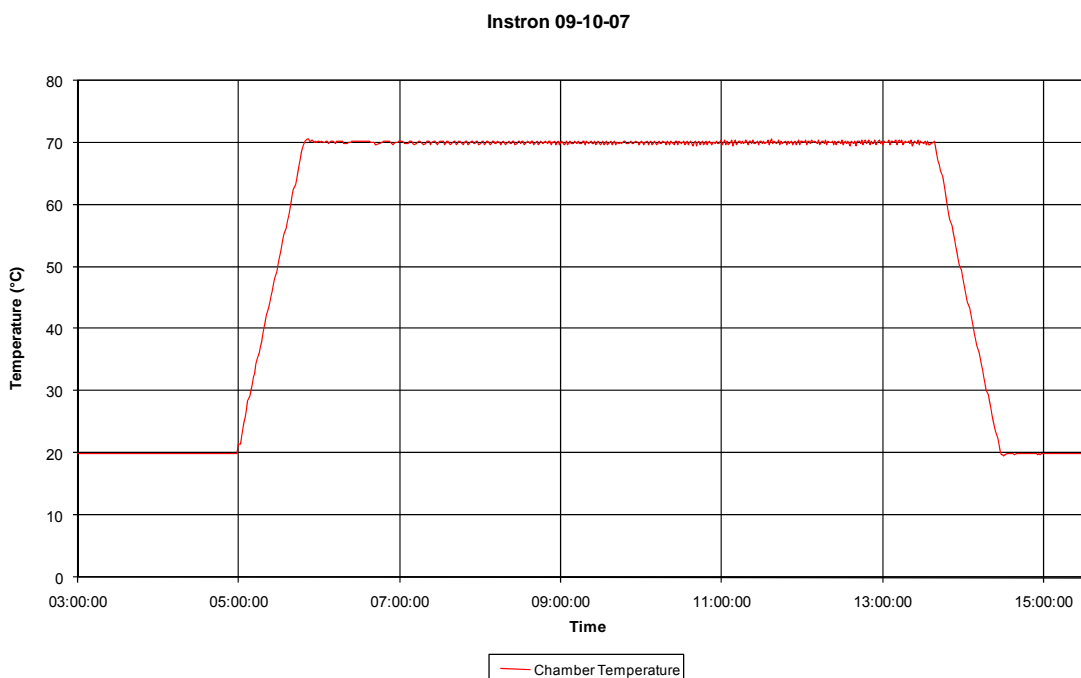
The test was performed with the EUT in the following mode(s): Idle (“Ready Condition”)*

*Note: EUT activated (entered Operating mode automatically) on contact with water.

Physical test configuration: as per Low-Temperature Thermal Shock Test, above.

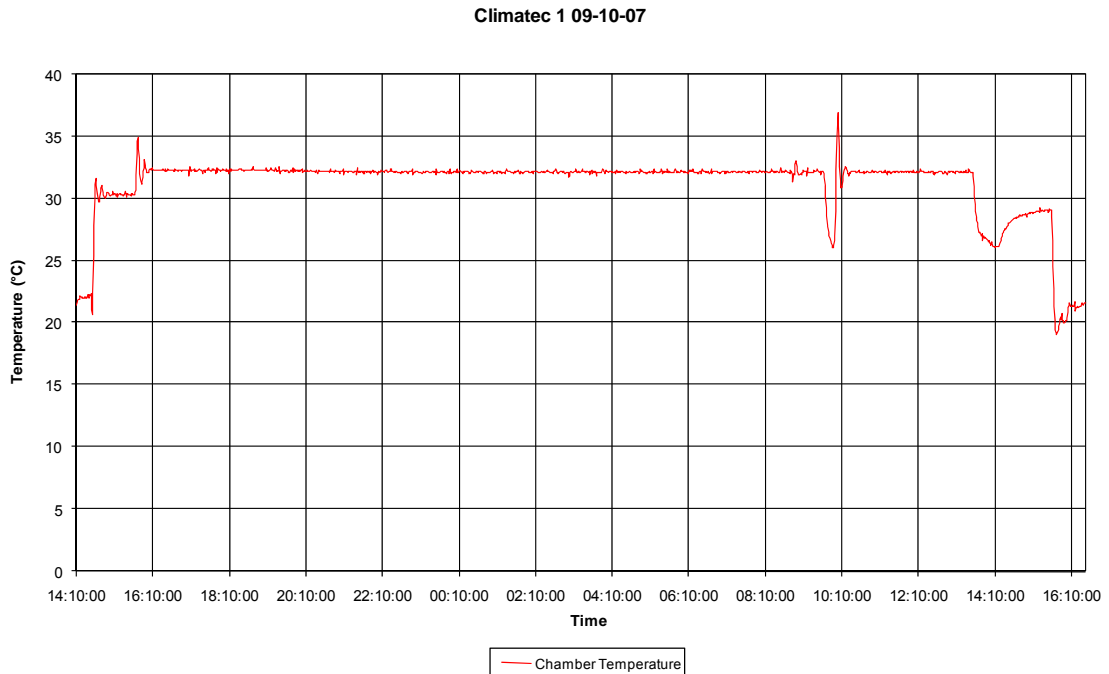
2.12.6 Environmental Conditions

Preconditioning Temperature Plot 1





Water Conditioning Temperature Plot 1



2.12.7 Test Results

EUT set to the Ready condition then placed in the climatic chamber. Chamber set to +70°C for a stabilisation of at least 3 hours.

EUT removed from chamber and totally immersed in fresh water at 32.5°C for 10 seconds then allowed to float in the same water for a further 5 minutes. EUT self-activated immediately as it was immersed and an Aliveness Test was performed, see Beacon Test Report below.

EUT removed from water, dried and deactivated automatically then set to the Ready condition then replaced in the climatic chamber, chamber temperature still +70°C.

EUT removed from chamber after stabilisation of at least 3 hours and totally immersed in salt water at 32.5°C for 10 seconds then allowed to float in the same water. EUT self-activated immediately as it was immersed and an Aliveness Test was performed, see Beacon Test Report below.

After 20 minutes the following measurements were conducted (results can be found in the Test Results Table, starting on page 17):

- Short-term frequency stability
- Medium-term frequency stability
 - Mean slope
 - Residual frequency variation

EUT was removed from water, dried and deactivated.



Product Service

Beacon Test Report (Aliveness Test, In Fresh Water)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 09-Oct-07 9:46:46 AM
Tester Model/Serial No./File Name: BT100S/1025/0166erfun-2
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

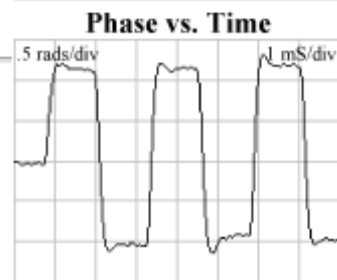
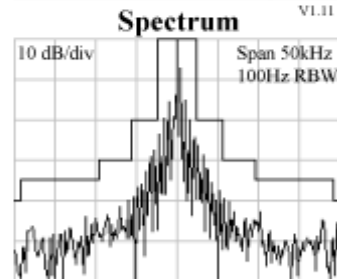
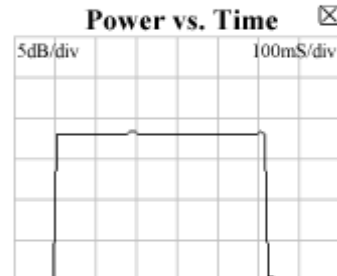
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 80%
Power Rise Time: < 5 ms
Phase Deviation: -1.04 +1.14 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, In Fresh Water)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 09-Oct-07 9:53:53 AM
Tester Model/Serial No./File Name: BT100S/1025/0166erfun-3
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

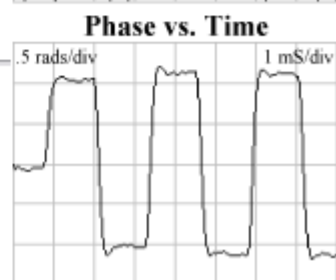
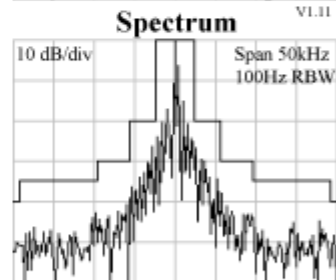
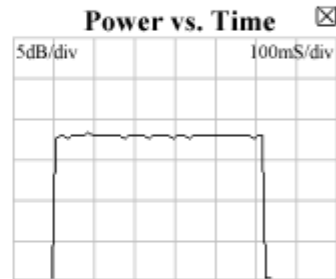
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0372 MHz
406 Power (INT ANT): 70%
Power Rise Time: < 5 ms
Phase Deviation: -1.02 +1.12 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 1.2%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.6 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, In Salt Water)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 09-Oct-07 1:53:14 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-almness-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

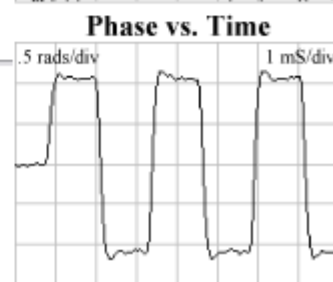
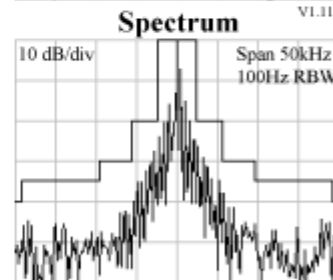
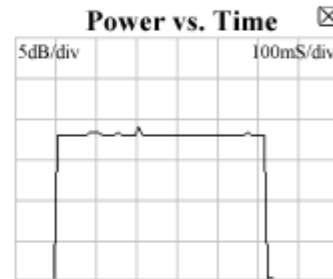
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFE2F8E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Normal Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0373 MHz
406 Power (INT ANT): 83%
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.06 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.7 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, In Salt Water)

Beacon Test Report
1D1E41FF3F81FE0

Organization:
Tested By:
Date: 09-Oct-07 1:39:26 PM
Tester Model/Serial No./File Name: BT100S/1025/01666-s1ftst-1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

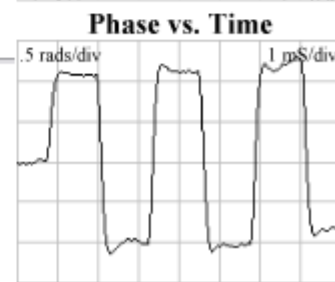
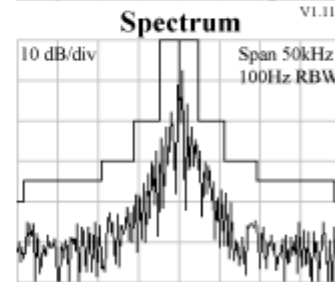
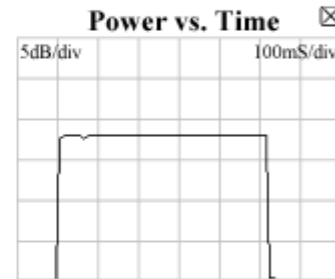
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1D1E41FF3F81FE0
Full Hex: FFFED08E8F20FF9FC0FF01E585379F3C0010
Burst Mode: Self Test Mode (Long)
Protocol: National Test Protocol
Country 232: United Kingdom
National ID #: 33790
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-109: Default
National Use: Default
Latitude: * * * * *
Longitude: * * * * *

406 MHz Measurements
406 Frequency (INT REF): 406.0372 MHz
406 Power (INT ANT): 90%
Power Rise Time: < 5 ms
Phase Deviation: -0.99 +1.11 radians
Modulation Rise Time: 153 uS
Modulation Fall Time: 153 uS
Modulation Symmetry: 1.1%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.6 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

2.13 OPERATIONAL LIFE TEST

2.13.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A13.1

2.13.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.13.3 Date of Test and Modification State

29 October 2007 - Modification State 1

2.13.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.13.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Operating



2.13.6 Pre-Test Results

Battery Discharge Current

The discharge current for the batteries was measured for each of the following beacon states.

Beacon in the Off or Standby State, "Standby Current"

Beacon performing a Self-test, "Self-test Current"

Beacon activated and transmitting, "Operating Current"

The individual tests were conducted for the following durations:

Standby Current	: 10.5 minutes	(631840 ms)
Self-test Current	: 3.92 seconds	(3920 ms)
GPS-test Current	: 210 seconds	(209920 ms)
Operating Current	: 30 minutes	(1799920 ms)

Assumptions / Supplied Data

Battery Replacement Interval	: 8 years
Battery Capacity	: 7.5 Ah
Battery Self Drain	: 0.75 % per year
Self-test Interval	: 12 tests per year
GPS-test Interval	: 1 tests per year

Test Results

Mode Current	= Accumulated Charge / Time
Standby Current	= 657109.36 pC / 631840 ms = 1.04 nA
Self-test Current	= 2345256.8 uC / 3920 ms = 598.28 mA
GPS-test Current	= 13630296 uC / 209920 ms = 64.93 mA
Operating Current	= 151804620 uC / 1799920 ms = 84.34 mA

Battery Preconditioning / Discharge Time Calculations

$$\begin{aligned} \text{Battery Self Drain} &= \text{Capacity} - [(100\% - \text{Self Drain/Year}\%)^{\text{Replacement Interval}} \times \text{Capacity}] \\ &= 7.5 - ((1 - 0.0075)^8 \times 7.5) = 0.4384 \text{ Ah} \end{aligned}$$

$$\begin{aligned} \text{Standby Drain} &= \text{Hours per year} \times \text{Battery Replacement Interval} \times \text{Standby Current} \\ &= 365 \times 24 \times 8 \times 1.04 \times 10^{-9} = 0.0001 \text{ Ah} \end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0001 \text{ Ah} = 0.0001 \text{ Ah}$$

$$\begin{aligned} \text{Self-test Drain} &= \text{Self-tests per battery} \times \text{Self-test Current} \times \text{Self-test duration (in hours)} \\ &= 12 \times 8 \times 598.28 \times 10^{-3} \times (3.92 / 3600) = 0.0625 \text{ Ah} \end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0625 \text{ Ah} = 0.1032 \text{ Ah}$$

$$\begin{aligned} \text{GPS-test Drain} &= \text{GPS-tests per battery} \times \text{GPS-test Current} \times \text{GPS-test duration (in hours)} \\ &= 1 \times 8 \times 64.93 \times 10^{-3} \times (210 / 3600) = 0.0303 \text{ Ah} \end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0303 \text{ Ah} = 0.0500 \text{ Ah}$$



Product Service

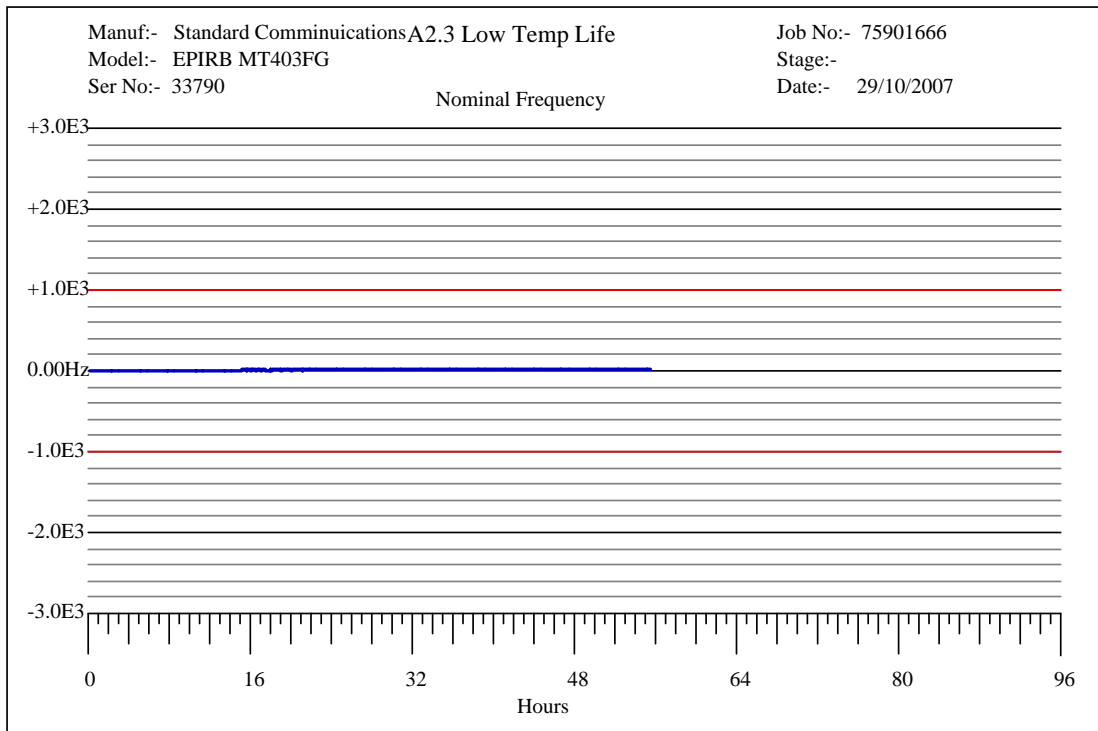
Total Drain = Self Drain + Standby Drain* + Self-test Drain* + GPS-test*
 = 0.4384 + 0.0001 + 0.1032 + 0.0303 = 0.5917 Ah

*Worst Case

Battery Preconditioning / Discharge Time = Worst Case drain / Operational Current
 = 0.5917 / (84.34 x 10⁻³)
 = 7.02 hours

The battery was discharged by operating the beacon for only 1 hour prior to the test; hence, the remaining 6 hours should be removed from the “time to first failure” figure given in the Table Of Test Results to provide an “Effective Operational Lifetime Duration”.

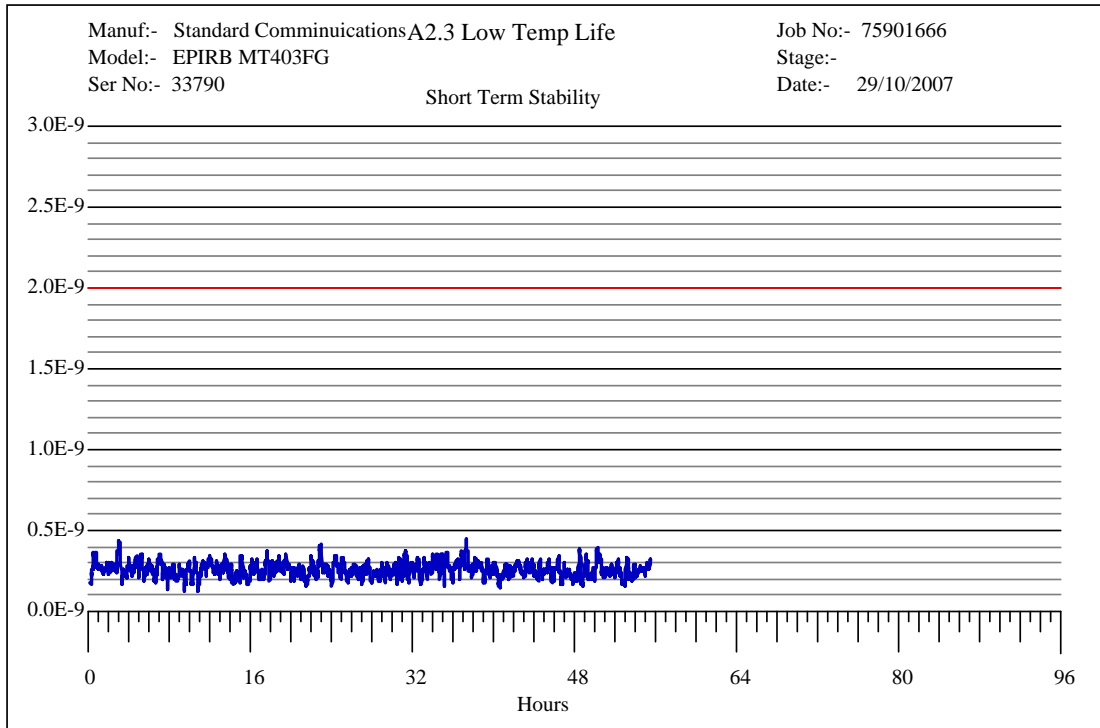
406 MHz Test Results



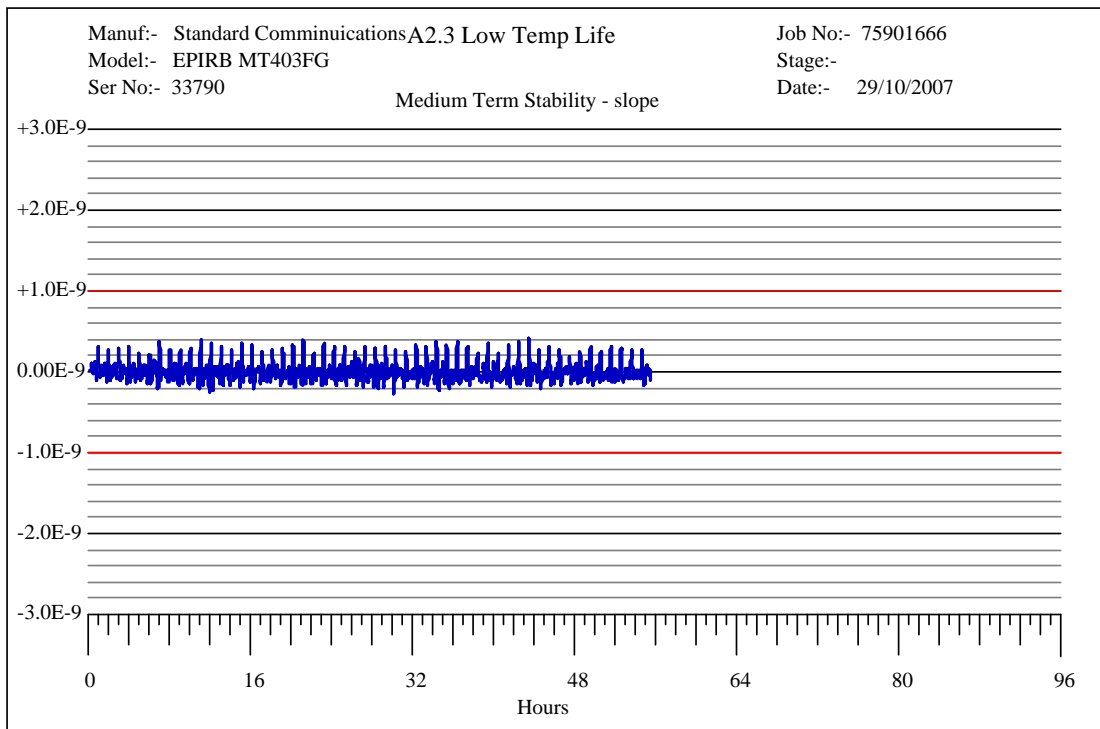
Nominal Frequency Offset



Product Service



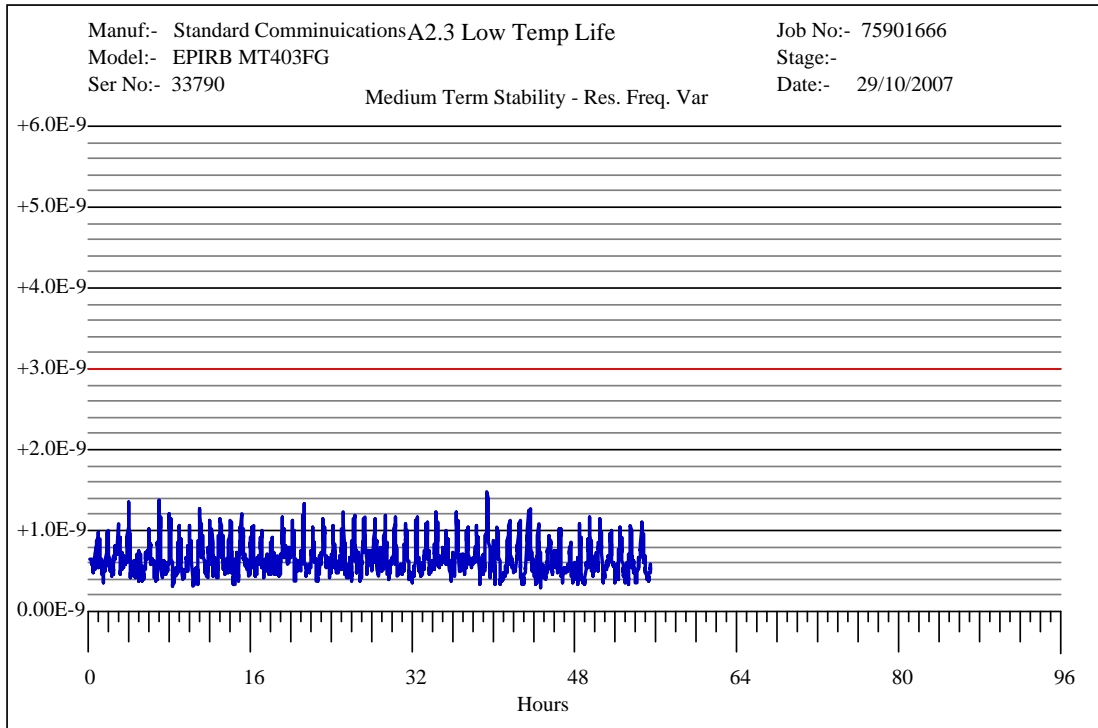
Short Term Stability



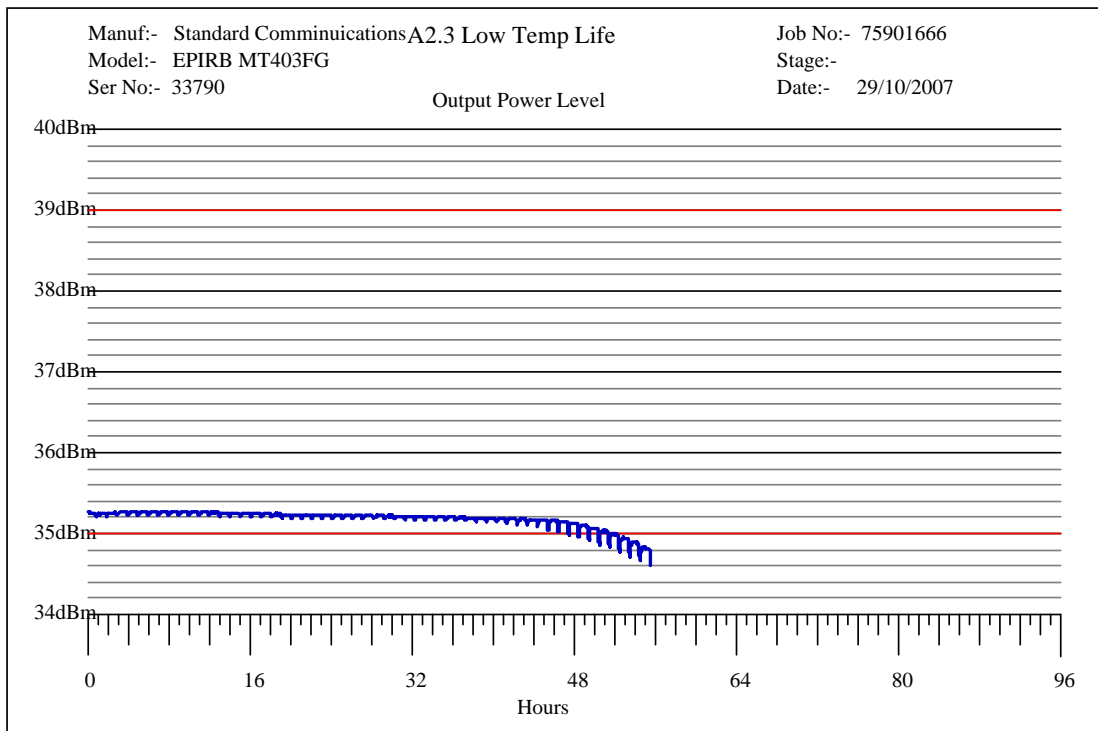
Medium Term Stability – Slope



Product Service



Medium Term Stability – Residual Frequency Variation



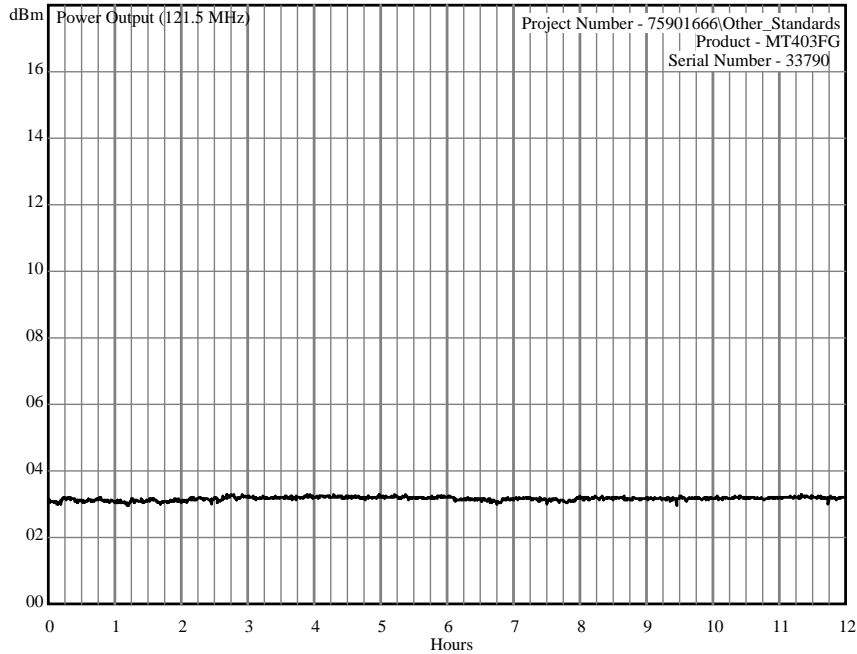
Output Power



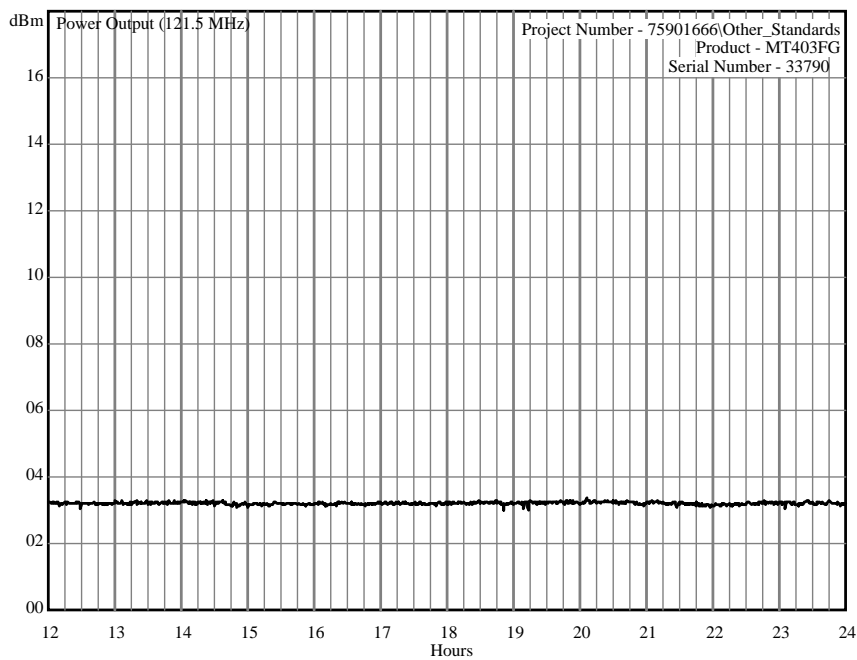
Product Service

121 MHz Test Results (Auxiliary Radio-locating Device Peak Envelope Output Power)

Summary of results can be found in the Test Results Table, starting on page 17.



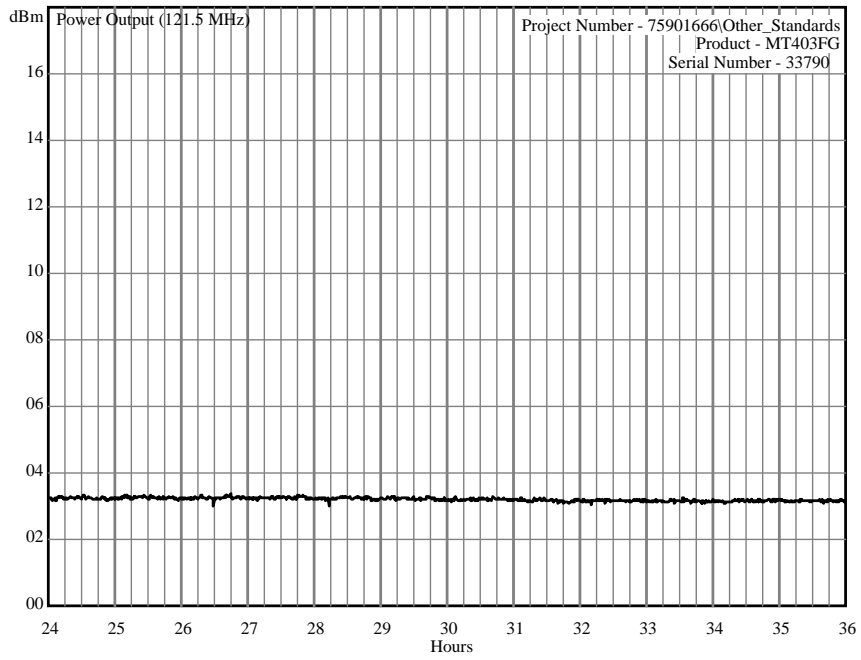
PEOP Graph 1



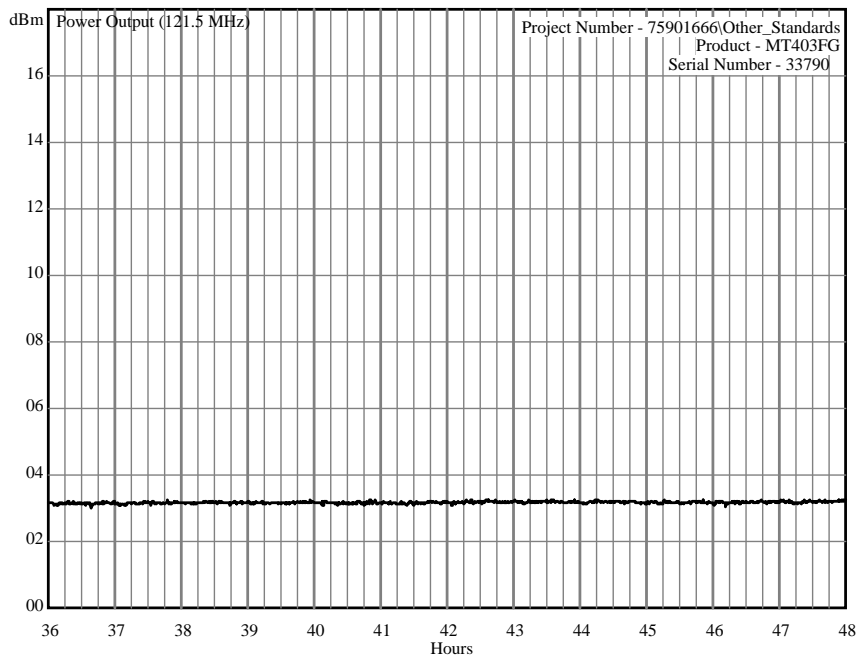
PEOP Graph 2



Product Service



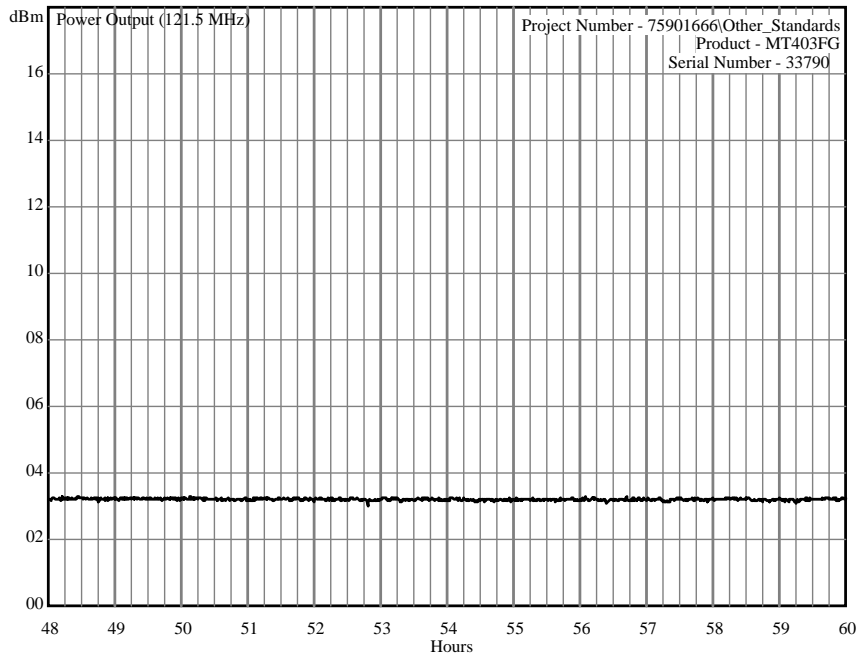
PEOP Graph 3



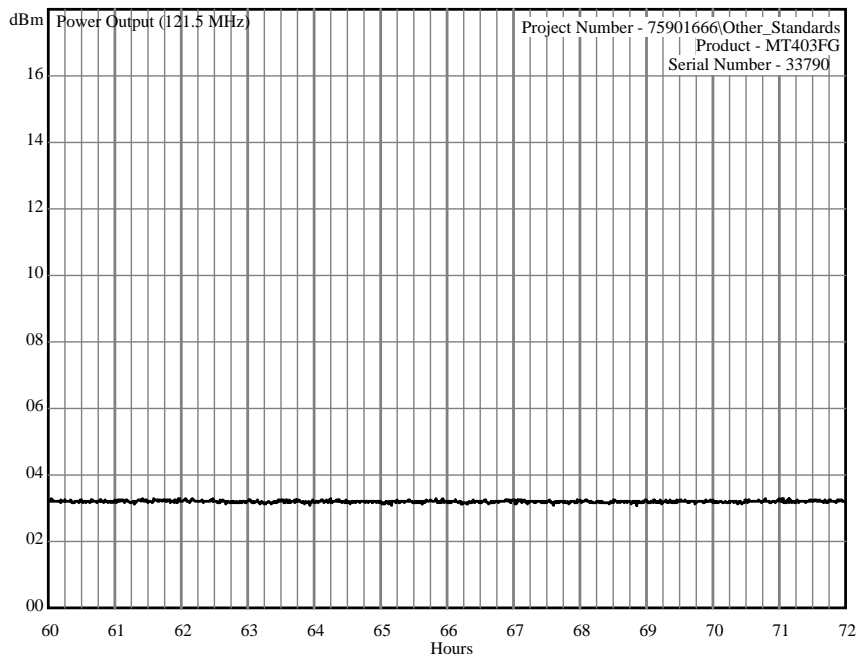
PEOP Graph 4



Product Service



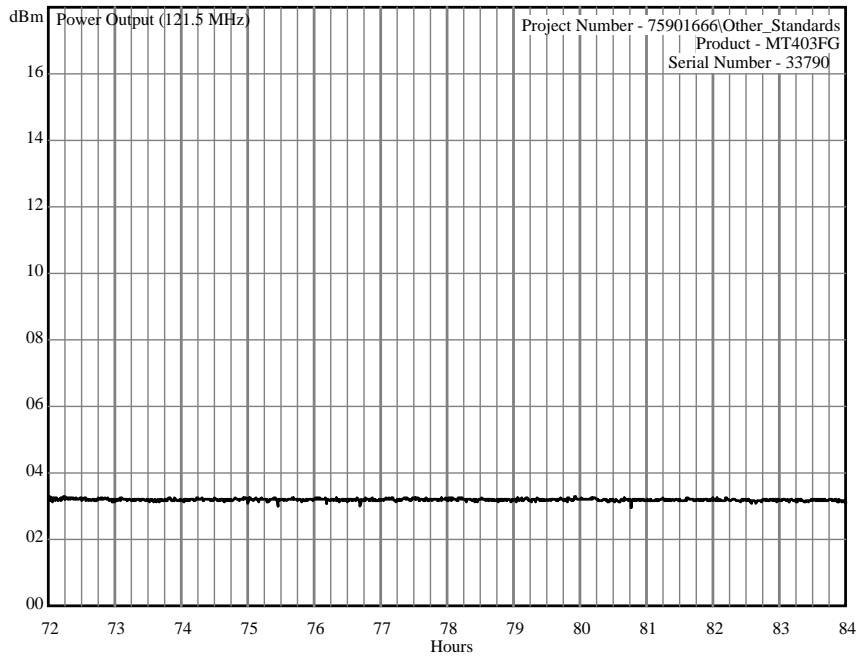
PEOP Graph 5



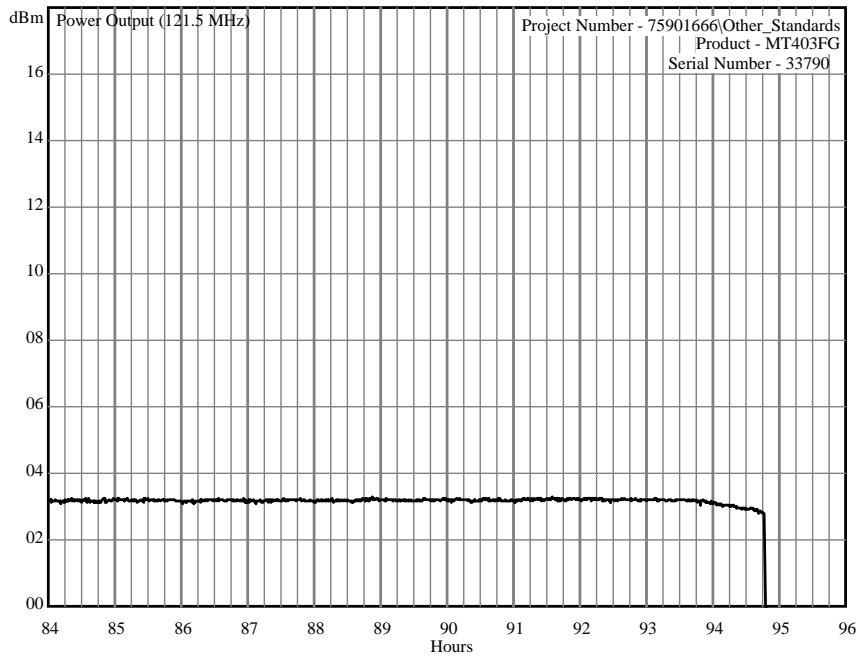
PEOP Graph 6



Product Service



PEOP Graph 7



PEOP Graph 8



Product Service

2.14 STROBE LIGHT TEST

2.14.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A13.2

2.14.2 Equipment Under Test

TÜV Product Service Ltd testing only: MT403G EPIRB, Serial Number 33790; and MT403G EPIRB, Serial Number: 33790. Note: this sample not controlled by TÜV Product Service Ltd, see Test Results, below.

2.14.3 Date of Test and Modification State

06 March 2008 - Modification State 2

2.14.4 Test Equipment Used

TÜV Product Service Ltd testing only: The major items of test equipment used for the above tests are identified in Section 3.1.

For effective intensity test see customer supplied information in annex A.

2.14.5 Test Set-up and Operating Modes

TÜV Product Service Ltd testing only: The test was performed with the EUT in the following mode(s): Operating

For effective intensity test see customer supplied information in annex A.

2.14.6 Environmental Conditions

Ambient Temperature 23.6°C
Relative Humidity 27.3%

2.14.7 Test Results

Tests (see note, below) completed as per customer supplied information, see Annex A.

Note: All tests completed as per customer supplied information under Clause A13.2 except strobe light duration; this was not completed at extreme operating temperatures. Test was conducted under the scope of this report at all three temperatures – extreme operating high, low and ambient for comparison (customer supplied information indicated a pulse duration of approximately 9.7ms).

Strobe Light Duration Summary

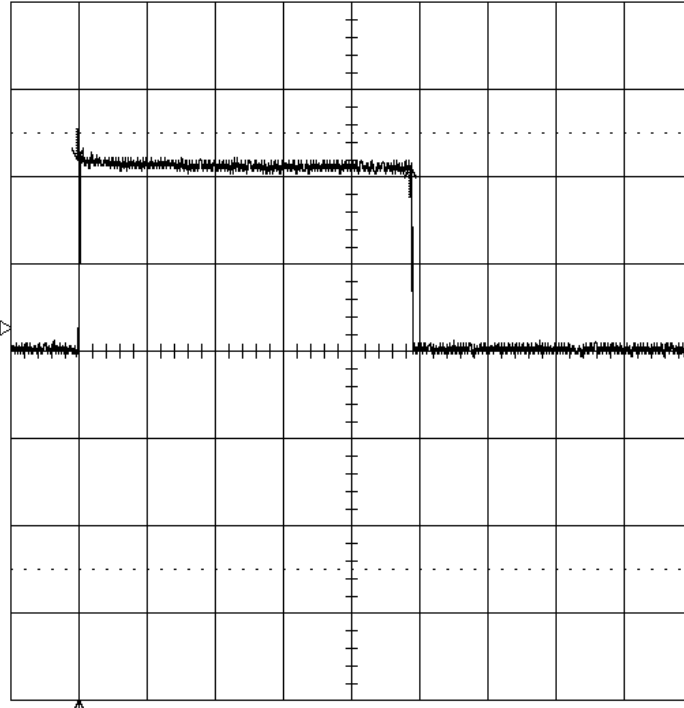
Parameter	Units	Test Results		
		T _{min} (-20°C)	T _{amb} (23.6°C)	T _{max} (+55°C)
Pulse duration	ms	9.778	9.752	9.738



Product Service

5-Mar-08
17:14:04

1
2 ms
2.00 V
-0.12 V



MEASURE

OFF **Cursors**
Parameters

mode
Time
Amplitude

type
Relative
Absolute

show
Diff - Ref
Diff & Ref

Reference
cursor
Track **OFF** On

Difference
cursor

2 ms

1 2 V DC

Δt 9.7520 ms $\frac{1}{\Delta t}$ 102.54 Hz

2.5 MS/s

2 50 mV DC \times_{100}



1 DC 0.56 V

STOPPED

Pulse Duration – Ambient

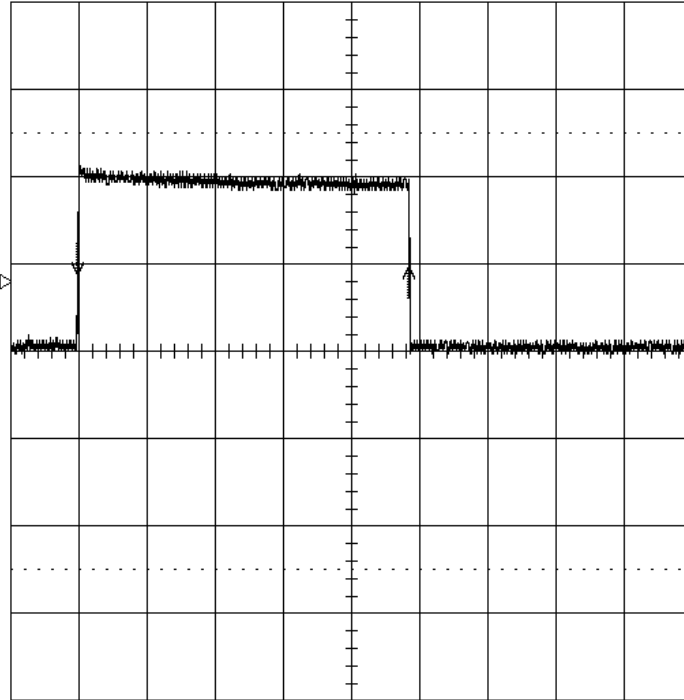


Product Service

6-Mar-08
16:27:18

MEASURE

1
2 ms
1.00 V
94 mV



OFF **Cursors**
Parameters

mode
Time
Amplitude

type
Relative
Absolute

show
Diff - Ref
Diff & Ref

Reference
cursor
Track **OFF** On

Difference
cursor

2 ms
1 1 V DC Δt 9.7384 ms $\frac{1}{\Delta t}$ 102.69 Hz
2 50 mV DC \times_{100} 1 DC 0.80 V

2.5 MS/s

STOPPED

Pulse Duration – High Temperature (+55°C)

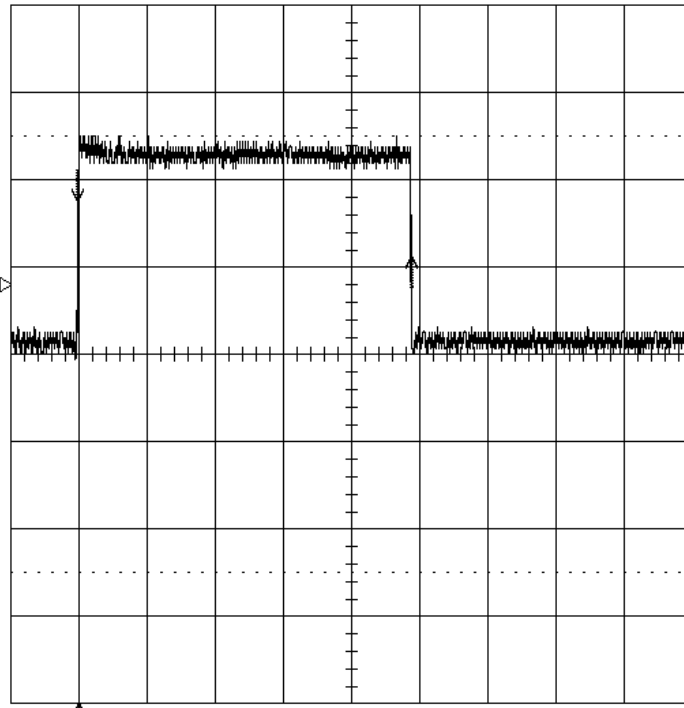


Product Service

MEASURE

6-Mar-08
12:42:01

1
2 ms
1.00 V
-0.62 V



OFF **Cursors**
Parameters

mode
Time
Amplitude

type
Relative
Absolute

show
Diff - Ref
Diff & Ref

Reference
cursor
Track **OFF** On

Difference
cursor

2 ms

1 1 V DC

Δt 9.7780 ms $\frac{1}{\Delta t}$ 102.27 Hz

2.5 MS/s

2 50 mV DC \times_{100}

1 DC 0.80 V

STOPPED

Pulse Duration – Low Temperature (-20°C)



Product Service

2.15 SELF-TEST

2.15.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A13.3

2.15.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.15.3 Date of Test and Modification State

Test at Ambient: 27 February 2008 - Modification State 2
 Test at +55°C: 28 February 2008 - Modification State 2
 Test at -20°C: 27 February 2008 - Modification State 2

2.15.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.15.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Operating and Self-test

2.15.6 Environmental Conditions

	27 February 2008	28 February 2008
Ambient Temperature	23.5°C	24.2°C
Atmospheric Pressure	1004mbar	1008mbar

2.15.7 Test Results

Summary of Aliveness test results

Stage	Pass / Fail
Ambient Aliveness Test	Pass
Ambient Self-test	Pass
High Temperature (+55°C) Aliveness Test	Pass
High Temperature (+55°C) Self-test	Pass
Low Temperature (-20°C) Aliveness Test	Pass
Low Temperature (-20°C) Self-test	Pass



Product Service

Beacon Test Report (Aliveness Test, Ambient Temperature)

Beacon Test Report
1925E847E2FFBFF

Organization: TÜV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 2/27/08 12:14:23 PM
 Tester Model/Serial No./File Name: BT100S/1025/1666ambinitialalive—2
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 26°C

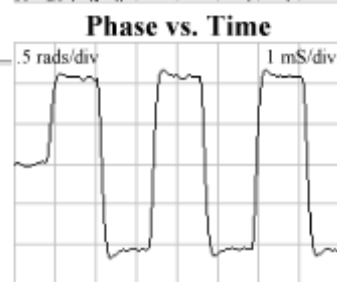
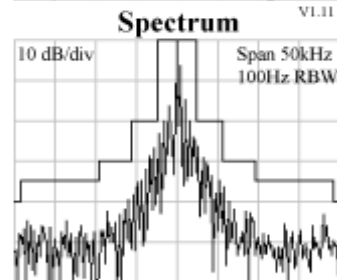
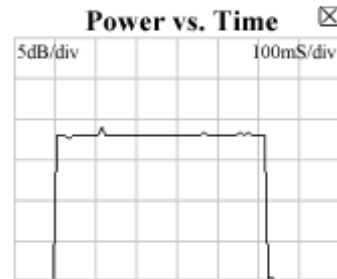
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1925E847E2FFBFF
 Full Hex: FFFE2F8C92F423F17FDFF90DB83783E0F66C
 Burst Mode: Normal Mode (Long)
 Protocol: EPIRB MMSI SLP Protocol
 Country 201: Albania
 MMSI: 999999
 Beacon Number: 1
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-110: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0373 MHz
 406 Power (5 Watt): 35.5 dBm
 Power Rise Time: < 5 ms
 Phase Deviation: -1.08 +1.09 radians
 Modulation Rise Time: 165 uS
 Modulation Fall Time: 165 uS
 Modulation Symmetry: 0.4%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 159.5 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Self-test, Ambient Temperature)

Beacon Test Report
1925E847E2FFBFF

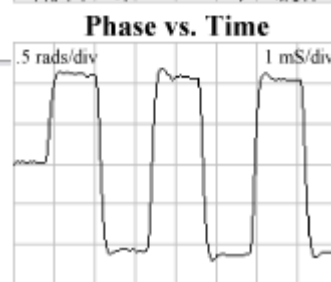
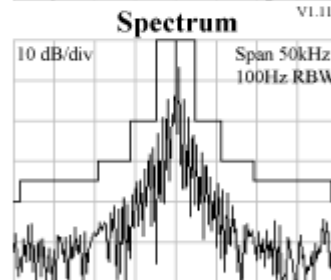
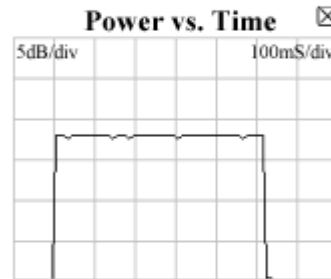
Organization: TÜV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 2/27/08 12:11:07 PM
 Tester Model/Serial No./File Name: BT100S/1025/1666ambinitialive—1
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 22°C

PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1925E847E2FFBFF
 Full Hex: FFFED08C92F423F17FDFF90DB83783E0F66C
 Burst Mode: Self Test Mode (Long)
 Protocol: EPIRB MMSI SLP Protocol
 Country 201: Albania
 MMSI: 999999
 Beacon Number: 1
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-110: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0373 MHz
 406 Power (5 Watt): 35.5 dBm
 Power Rise Time: < 5 ms
 Phase Deviation: -1.07 +1.08 radians
 Modulation Rise Time: 153 uS
 Modulation Fall Time: 177 uS
 Modulation Symmetry: 0.8%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 159.6 ms



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, High Temperature, +55°C)

Beacon Test Report
1925E847E2FFBFF

Organization: TÜV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 2/28/08 10:09:57 AM
 Tester Model/Serial No./File Name: BT100S/1025/166655initialalive—2
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 27°C

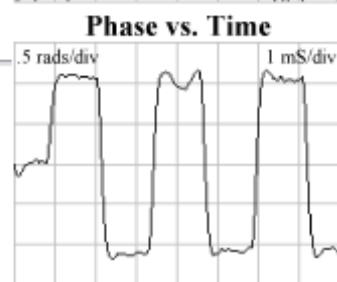
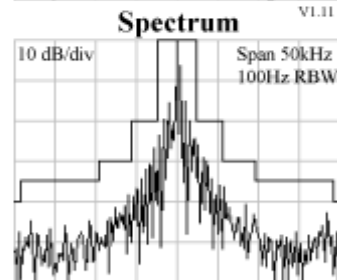
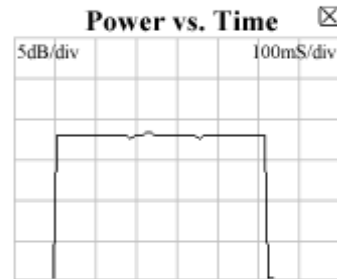
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1925E847E2FFBFF
 Full Hex: FFFE2F8C92F423F17FDFF90DB83783E0F66C
 Burst Mode: Normal Mode (Long)
 Protocol: EPIRB MMSI SLP Protocol
 Country 201: Albania
 MMSI: 999999
 Beacon Number: 1
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-110: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0373 MHz
 406 Power (5 Watt): 34.3 dBm
 Power Rise Time: < 5 ms
 Phase Deviation: -1.12 +1.01 radians
 Modulation Rise Time: 177 uS
 Modulation Fall Time: 188 uS
 Modulation Symmetry: 0%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 159.8 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Self-test, High Temperature, +55°C)

Beacon Test Report
1925E847E2FFBFF

Organization: TÜV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 2/28/08 10:08:20 AM
 Tester Model/Serial No./File Name: BT100S/1025/166655initialalive—1
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 25°C

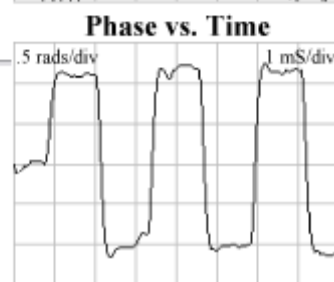
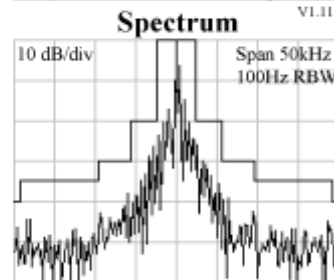
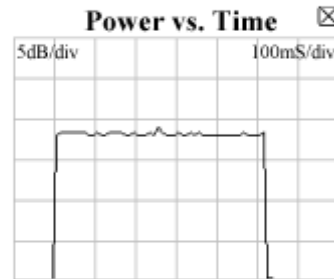
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1925E847E2FFBFF
 Full Hex: FFFED08C92F423F17FDFF90DB83783E0F66C
 Burst Mode: Self Test Mode (Long)
 Protocol: EPIRB MMSI SLP Protocol
 Country 201: Albania
 MMSI: 999999
 Beacon Number: 1
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-110: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0372 MHz
 406 Power (5 Watt): 34.5 dBm
 Power Rise Time: < 5 ms
 Phase Deviation: -1.03 +1.16 radians
 Modulation Rise Time: 722 uS
 Modulation Fall Time: 165 uS
 Modulation Symmetry: 0.8%
 Modulation Bit Rate: 399.7 bps
 CW Preamble: 159.6 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Aliveness Test, Low Temperature, -20°C)

Beacon Test Report

1925E847E2FFBFF

Organization: TÜV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 2/27/08 4:45:27 PM
 Tester Model/Serial No./File Name: BT100S/1025/1666-20initialalive—3
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 25°C

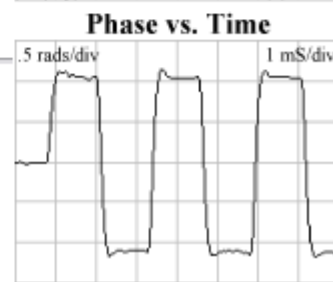
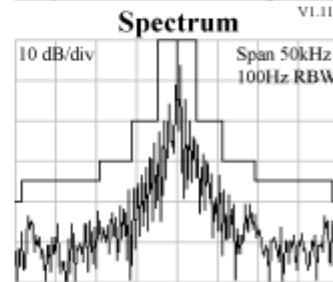
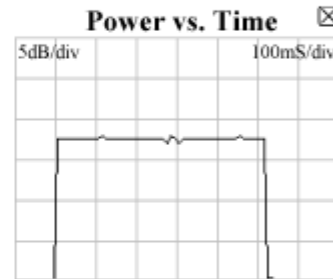
PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1925E847E2FFBFF
 Full Hex: FFFE2F8C92F423F17FDFF90DB83783E0F66C
 Burst Mode: Normal Mode (Long)
 Protocol: EPIRB MMSI SLP Protocol
 Country 201: Albania
 MMSI: 999999
 Beacon Number: 1
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-110: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0373 MHz
 406 Power (5 Watt): 35.2 dBm
 Power Rise Time: < 5 ms
 Phase Deviation: -1.1 +1.04 radians
 Modulation Rise Time: 177 uS
 Modulation Fall Time: 177 uS
 Modulation Symmetry: 1.1%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 155.1 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.



Product Service

Beacon Test Report (Self-test, Low Temperature, -20°C)

Beacon Test Report

1925E847E2FFBFF

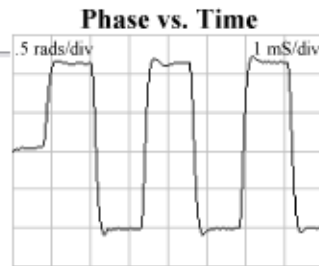
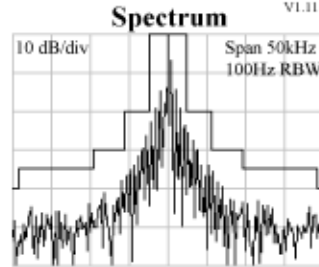
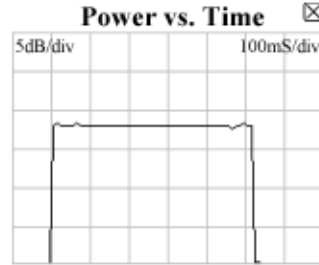
Organization: TÜV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 2/27/08 4:47:00 PM
 Tester Model/Serial No./File Name: BT100S/1025/1666-20initialalive—4
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 24°C

PASS FAIL INITIALS: _____

Notes: Add text comments here.

15 Hex ID: 1925E847E2FFBFF
 Full Hex: FFFED08C92F423F17FDFF90DB83783E0F66C
 Burst Mode: Self Test Mode (Long)
 Protocol: EPIRB MMSI SLP Protocol
 Country 201: Albania
 MMSI: 999999
 Beacon Number: 1
 Position Source: Internal GPS
 Auxiliary Radio: 121.5 MHz
 Bits 107-110: Default
 Latitude: * * * * *
 Longitude: * * * * *

406 MHz Measurements
 406 Frequency (INT REF): 406.0372 MHz
 406 Power (5 Watt): 35.3 dBm
 Power Rise Time: < 5 ms
 Phase Deviation: -1.01 +1.13 radians
 Modulation Rise Time: 153 uS
 Modulation Fall Time: 177 uS
 Modulation Symmetry: 0.8%
 Modulation Bit Rate: 399.5 bps
 CW Preamble: 159.9 ms



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Beacon tester calibration status is TU (traceability unscheduled) therefore calibration due date should be ignored.

Self-test Results

Parameter	Units	Test Results		
		T _{min} (-20°C)	T _{amb}	T _{max} (+55°C)
Pulse duration	ms	520.7015	520.5828	520.0304
Frame sync pattern	9 binary bits	0 1101 0000	0 1101 0000	0 1101 0000
Number of bursts	number	1	1	1
15 Hex ID	15 hexadecimal bits	1925E847E2FFBFF	1925E847E2FFBFF	1925E847E2FFBFF



Product Service

2.16 AUTOMATIC RELEASE MECHANISM AND AUTOMATIC ACTIVATION TESTS

2.16.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A14.0

2.16.2 Test Results

Test completed as per sub-contractor information (QinetiQ) – refer to Annex B



Product Service

2.17 STABILITY AND BUOYANCY TEST

2.17.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A15.0

2.17.2 Equipment Under Test

MT403G EPIRB, Serial Number 33790

2.17.3 Date of Test and Modification State

22 November 2007- Modification State 1

2.17.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.17.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle*

*Note: EUT activated (entered Operating mode automatically) on contact with water.

2.17.6 Environmental Conditions

Test Water Temperature	18°C
Relative Humidity	39.5%
Atmospheric Pressure	1004mbar

2.17.7 Test Results

Stability

The EUT was completely submerged just below the surface in calm fresh water in the horizontal plane. The EUT was released and the time taken (seconds) for the antenna to pass through an upright position was measured. The test was repeated 3 times and the mean time calculated.

$T_1=1.66s$

$T_2=1.47s$

$T_3=1.54s$

$T_{Average}= 1.56s$



Product Service

Uprightness

The EUT was immersed in calm fresh water as shown in the following photograph and floated upright.



EUT Immersed In Fresh Water

Antenna Height

When floating upright the Antenna base was measured and found to be 60mm above the water line.



Product Service

Reserve Buoyancy

A large tank was filled with domestic tap water. A 20Kg mass with a pulley attachment was submerged into the tank. The pulley converted an upwards vertical force into a downwards force, completely submerging the EUT into the tank. The upwards vertical force supplied by the engineer was measured with a force gauge. This was the buoyant force. The EUT was strapped with cable ties to create a central fixing point for the pulley at the base of the EUT.

EUT mass = 0.605 Kg
 EUT weight = 5.935 N

Buoyant forces measured were:

Buoyant Force₁ = 3.25 N
 Buoyant Force₂ = 3.10 N
 Buoyant Force₃ = 3.13 N
Buoyant Force_{Average} = 3.16N

Reserve buoyancy = $\frac{\text{Buoyant Force}}{\text{Weight}} = \frac{3.16}{5.935}$

Reserve buoyancy = 0.532